

Lesions coronàries no culpables en SCA: què fem?

Revascularització completa



Albert Ariza Solé
Hospital Universitari de Bellvitge
L'Hospitalet de Llobregat. Barcelona.

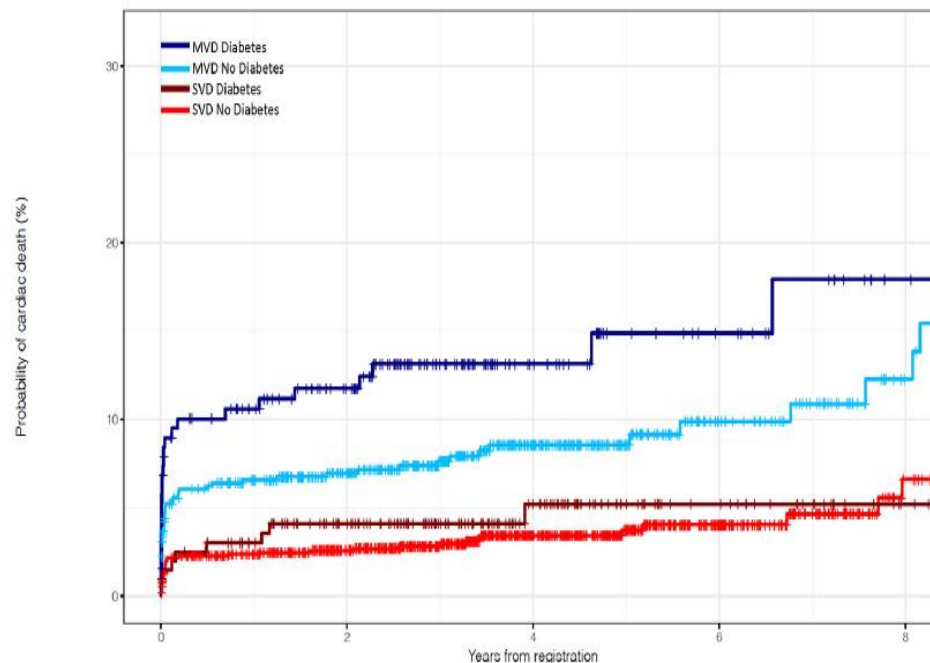
Introducció



PROGRAMA
SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
2022-2023

- Més de la meitat de pacients amb IAMEST presenten malaltia coronària multivàs.
- Aquests pacients presenten una major incidència d'esdeveniments cardiovasculars.

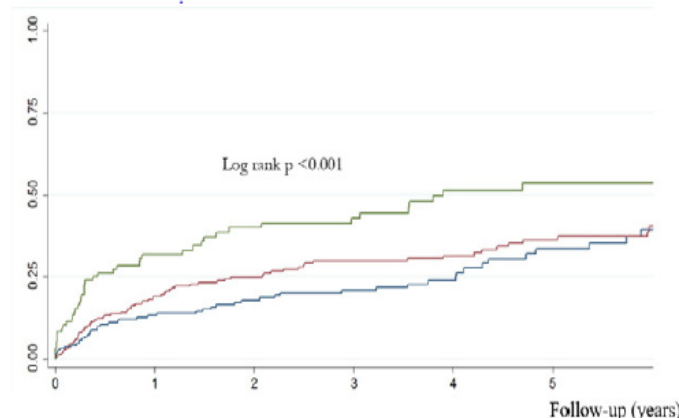
La presència de malaltia multivàs empitjora el pronòstic dels pacients amb IAMEST.



Burgess S, et al. Cardiac mortality, diabetes mellitus, and multivessel disease in ST elevation myocardial infarction. Int J Cardiol. 2021 Jan 15;323:13-18.

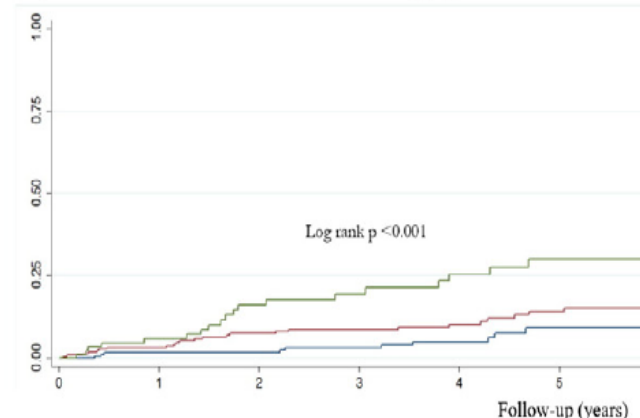
Revascularització parcial: Syntax score residual i pronòstic en l'IAMEST amb malaltia multivàs

Kaplan-Meier curves for cumulative MACE (%)



— Complete revascularization — Reasonable incomplete revascularization — Incomplete revascularization

Kaplan-Meier curves for cumulative all-cause mortality (%)



— Complete revascularization — Reasonable incomplete revascularization — Incomplete revascularization

Braga CG, et al. Prognostic impact of residual SYNTAX score in patients with ST-elevation myocardial infarction and multivessel disease: Analysis of an 8-year all-comers registry. Int J Cardiol. 2017 Sep 15;243:21-26.

Risc trombòtic residual: importància de l'anatomia coronària

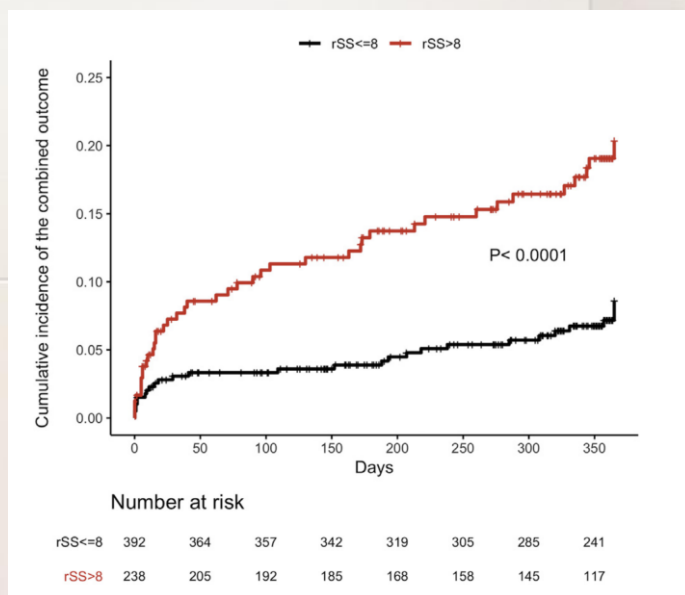


Table 3. HRs and 95% CIs of 1-year mortality or cardiovascular event estimated from multivariable Cox regression models

Predictors	Core model* + bSS	Model including only rSS	Core model* + rSS
Age (y)	1.08 (1.03-1.13)	-	1.08 (1.03-1.14)
Prior MI	2.15 (1.25-3.69)	-	2.02 (1.17-3.49)
STEMI	1.87 (1.14-3.06)	-	1.88 (1.14-3.09)
bSS	1.04 (1.01-1.06)	-	-
rSS	-	1.06 (1.03-1.08)	1.05 (1.02-1.07)
AIC	822	832	819
c-statistic	0.690	0.644	0.700
Optimism -corrected c-statistics	0.681	0.643	0.691

Morici N, et al. Residual SYNTAX Score and One-Year Outcome in Elderly Patients With Acute Coronary Syndrome. CJC Open. 2020;2:236-243.

Procedural aspects of the primary percutaneous coronary intervention strategy

Recommendations	Class ^a	Level ^b
IRA strategy		
Primary PCI of the IRA is indicated. ^{114,116,120,140}	I	A
New coronary angiography with PCI if indicated is recommended in patients with symptoms or signs of recurrent or remaining ischaemia after primary PCI.	I	C
IRA technique		
Stenting is recommended (over balloon angioplasty) for primary PCI. ^{146,147}	I	A
Stenting with new-generation DES is recommended over BMS for primary PCI. ^{148–151,170,179}	I	A
Radial access is recommended over femoral access if performed by an experienced radial operator. ^{143–145,180}	I	A
Routine use of thrombus aspiration is not recommended. ^{157,159}	III	A
Routine use of deferred stenting is not recommended. ^{153–155}	III	B
Non-IRA strategy		
Routine revascularization of non-IRA lesions should be considered in STEMI patients with multivessel disease before hospital discharge. ^{167–173}	IIa	A
Non-IRA PCI during the index procedure should be considered in patients with cardiogenic shock.	IIa	C
CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.	IIa	C

Ibáñez B, et al. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. Rev Esp Cardiol. 2017;70:1082.

Dades observacionals

- Pacients amb revascularització completa més joves, amb millor funció ventricular i menor % de CTO.

Table 1. Risk Factor Prevalence Before Propensity Matching According to Index Procedure Revascularization Strategy in STEMI Patients With Multivessel CAD

Risk Factor	% in Study Population (n = 4,024)	% With Culprit Vessel Revascularization at the Time of PPCI (n = 3,521)	% With Multivessel Revascularization at the Time of PPCI (n = 503)	p Value
Demographic factors				
Age, yrs				0.001
59 or less	46.94	45.84	54.67	
60–69	24.18	24.54	21.67	
70–79	18.84	19.51	14.12	
80 or more	10.04	10.11	9.54	
Female	26.09	26.24	25.05	0.57
Race				0.31
White	84.37	84.13	86.08	
Black	7.88	8.12	6.17	
Other	7.75	7.75	7.75	
Cardiac factors				
No. of vessels diseased				0.46
2 no proximal LAD	53.16	53.56	50.30	
2 with proximal LAD	21.89	21.58	24.06	
3 no proximal LAD	16.05	15.90	17.10	
3 with proximal LAD	8.90	8.95	8.55	
Ejection fraction				0.01
19% or less	1.94	1.73	3.38	
20%–29%	8.28	8.38	7.55	
30%–39%	18.24	18.52	16.30	
40%–49%	31.56	32.04	28.23	
50% or more	39.99	39.34	44.53	
Hemodynamic instability				0.66
Unstable	4.40	4.35	4.77	
CHF history				0.41
This admission	7.08	6.96	7.95	
Chronic total occlusion	17.77	19.54	5.37	<0.0001
TIMI flow grade ≤2 in culprit vessel	50.89	51.95	43.54	0.0004
Comorbidities				
Cerebrovascular	4.60	4.71	3.78	0.35
Peripheral vascular	4.13	4.12	4.17	0.95
Diabetes	21.69	21.41	23.66	0.25
Ventricular arrhythmia	1.47	1.42	1.79	0.52
COPD	4.75	4.66	5.37	0.48
Renal dialysis	0.72	0.71	0.80	0.83
Creatinine >2.5 mg	1.02	1.05	0.80	0.59
Type of PCI				
Only drug-eluting stent used	66.59	61.09	57.06	<0.0001
Bare-metal stent used	34.74	33.80	41.35	
No stent used	4.67	5.11	1.59	

Hannan EL, et al. Culprit vessel percutaneous coronary intervention versus multivessel and staged percutaneous coronary intervention for ST-segment elevation myocardial infarction patients with multivessel disease. JACC Cardiovasc Interv. 2010;3:22-31.

Dades observacionals

Table 5. Mortality Rates (%) for Propensity Matched Multivessel Disease STEMI Patients by Revascularization Strategy During the Index Procedure

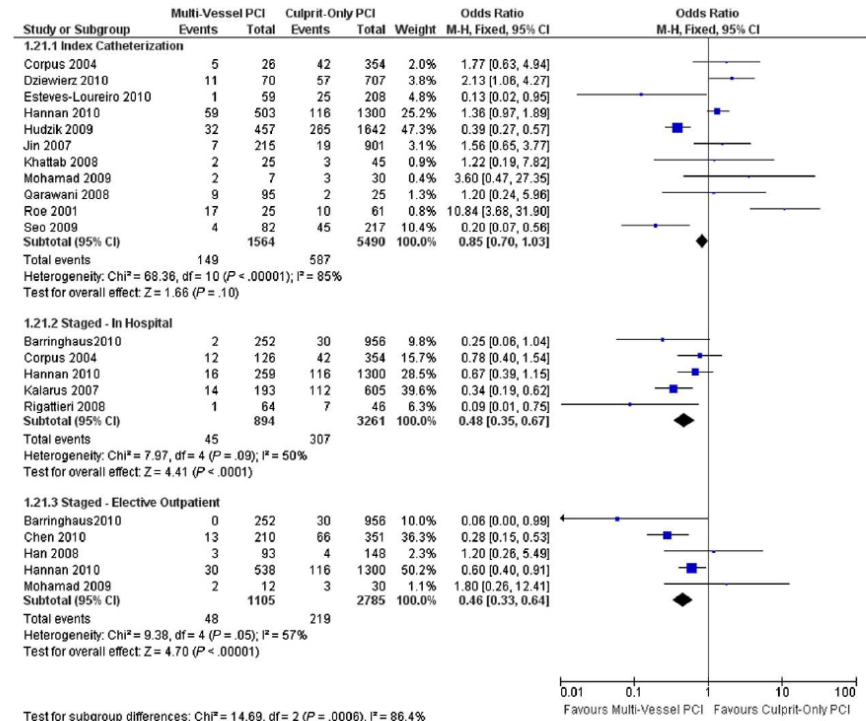
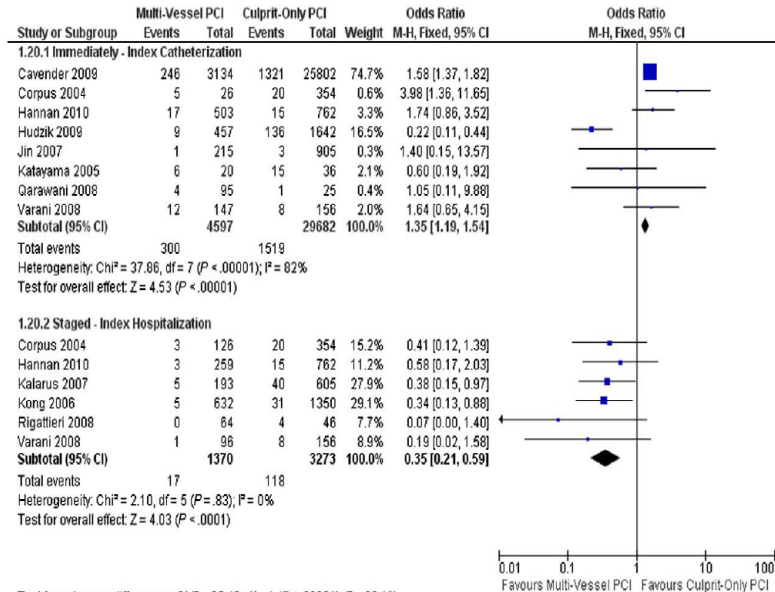
Outcome by Subgroup	Culprit Vessel Revascularization at the Time of PPCI	Multivessel Revascularization at the Time of PPCI	Percentage Difference	p Value
All patients	n = 503	n = 503		
Death, %				
In-hospital	2.0	3.4	1.4	0.14
12 months	5.5	7.1	1.6	0.23
24 months	6.6	8.6	2.0	0.17
42 months	10.8	11.8	1.0	0.23
Patients without hemodynamic instability, LVEF <20%, malignant ventricular arrhythmia	n = 458	n = 458		
Death, %				
In-hospital	0.9	2.4	1.5	0.04
12 months	4.2	5.8	1.6	0.13
24 months	4.9	7.2	2.3	0.07
42 months	6.7	10.4	3.7	0.08

Hannan EL, et al. Culprit vessel percutaneous coronary intervention versus multivessel and staged percutaneous coronary intervention for ST-segment elevation myocardial infarction patients with multivessel disease. JACC Cardiovasc Interv. 2010;3:22-31.

Metaanàlisi



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SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
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Bainey KR, et al. Complete vs culprit-only revascularization for patients with multivessel disease undergoing primary percutaneous coronary intervention for ST-segment elevation myocardial infarction: a systematic review and meta-analysis. Am Heart J. 2014 Jan;167(1):1-14.e2.

Cal aleatoritzar!!!!!!!

Estudis aleatoritzats



PROGRAMA
SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
2022-2023

- Diversos estudis aleatoritzats mostren una reducció d'esdeveniments isquèmics amb la revascularització completa de pacients amb IAMEST i malaltia multivàs sotmesos a ICP primari.
- Principals limitacions
 - Factibilitat de la revascularització
 - Extrapolabilitat troballes (exclosos pacients inestables, lesions a tronc comú, oclusions cròniques) a pacients de la pràctica clínica quotidiana.

The CULPRIT trial

- 296 patients amb IAMEST i malaltia multivàs.
- Aleatoritzats a ICP durant l'ingrés a la resta de lesions significatives no culpables (n=150) vs no revascularització addicional (n=146)
- Outcome primari: mort global, infart de miocardi, insuficiència cardíaca o revascularització guiada per isquèmia als 12m.

Gershlick AH, et al. Randomized trial of complete versus lesion-only revascularization in patients undergoing primary percutaneous coronary intervention for STEMI and multivessel disease: the CvLPRIT trial. J Am Coll Cardiol. 2015 ;65:963-72.

The CULPRIT trial

TABLE 1 Demographics and Baseline Clinical Characteristics

	Complete Revascularization (n = 150)	IRA-Only Revascularization (n = 146)	p Value
Age, yrs	64.6 ± 11.2	65.3 ± 11.9	0.57
Male	128 (85.3)	112 (76.7)	0.06
Treated diabetes	19/147 (12.9)	20/140 (14.3)	0.74
Treated hypertension	54/147 (36.6)	51/140 (36.4)	0.96
Treated hypercholesterolemia	41/147 (27.9)	34/140 (24.3)	0.49
Current smoker	50/146 (34.3)	37/138 (26.8)	0.17
Previous MI	7/147 (4.8)	5/140 (3.6)	0.62
Previous PCI	6/147 (4.1)	3/140 (2.1)	0.50
Killip class II/III on admission	10/147 (6.8)	13/139 (9.4)	0.43
GFR <30 mL/min	1/140 (0.7)	1/137 (0.7)	1.00
Anterior MI	54/150 (36.0)	52/146 (35.6)	0.94
IRA site (selected CASS)			
1 Proximal RCA	29 (19.3)	30 (20.5)	0.82
2 Mid RCA	23 (15.3)	24 (16.4)	
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)	0.96
2 Mid RCA	24 (16.0)	23 (15.8)	
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
2-Vessel disease	119 (79.3)	110 (75.3)	0.41
3-Vessel disease	31 (20.7)	36 (24.7)	
Symptom to balloon time, min	182 (115-282)	159 (119-265)	0.41
Maximum HS-TnT elevation	985 (629-1,625)	1073 (509-1,824)	0.96
EF (by CMR), %	45.8 ± 9.8 (n = 100)	45.1 ± 9.5 (n = 103)	0.57
Balloon pump	2 (1)	1 (0.6)	1.00
Radial approach	112/146 (76.7)	102/140 (72.9)	0.45

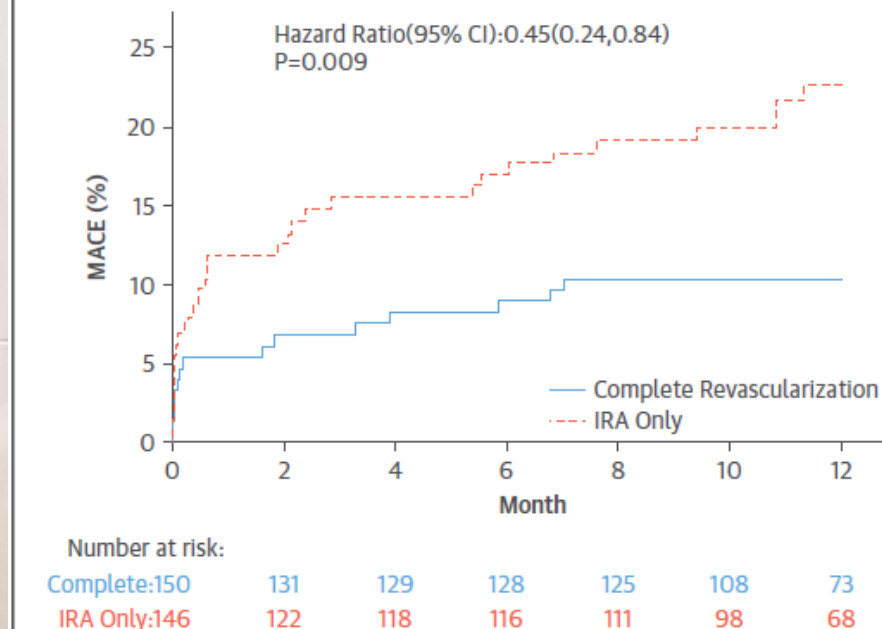
Gershlick AH, et al. Randomized trial of complete versus lesion-only revascularization in patients undergoing primary percutaneous coronary intervention for STEMI and multivessel disease: the CvLPRIT trial. J Am Coll Cardiol. 2015 ;65:963-72.

The CULPRIT trial

TABLE 3 Clinical Outcomes at 12 Months

	Complete Revascularization (n = 150)	IRA-Only Revascularization (n = 146)	HR (95% CI)	p Value
Time to first event				
MACE	15 (10.0)	31 (21.2)	0.45 (0.24-0.84)	0.009
All-cause mortality	2 (1.3)	6 (4.1)	0.32 (0.06-1.60)	0.14
Recurrent MI	2 (1.3)	4 (2.7)	0.48 (0.09-2.62)	0.39
HF*	4 (2.7)	9 (6.2)	0.43 (0.13-1.39)	0.14
Repeat revascularization	7 (4.7)	12 (8.2)	0.55 (0.22-1.39)	0.20
All events				
All-cause mortality	4 (2.7)	10 (6.9)	0.38 (0.12-1.20)	0.09
Recurrent MI	2 (1.3)	4 (2.7)	0.47 (0.09-2.59)	0.38
Type 1	0	2		
Type 4b	2	2		
HF	5 (3.3)	10 (6.9)	0.47 (0.16-1.38)	0.16
Inpatient	3	7		0.56
Post-discharge	2	3		
Repeat revascularization	8 (5.3)	16 (11.0)	0.46 (0.20-1.08)	0.07
Safety				
CV mortality	2 (1.3)	7 (4.8)	0.27 (0.06-1.32)	0.11
Stroke	2 (1.3)	2 (1.4)	0.95 (0.13-6.77)	0.96
Major bleed	4 (2.7)	7 (4.8)	0.55 (0.16-1.87)	0.34
Contrast-induced nephropathy	2 (1.4)	2 (1.4)	0.94 (0.13-6.75)	0.95

FIGURE 2 Kaplan-Meier Curves



Gershlick AH, et al. Randomized trial of complete versus lesion-only revascularization in patients undergoing primary percutaneous coronary intervention for STEMI and multivessel disease: the CvLPRIT trial. J Am Coll Cardiol. 2015 ;65:963-72.

The PRAMI trial

- 465 pacients amb IAMEST i malaltia multivàs sotmesos a ICP primari.
- Aleatoritzats a ICP immediata la resta de lesions significatives no culpables (n=234) vs no revascularització addicional (n=231).
- Outcome primari: mort cardiovascular, infart de miocardi, o angina refractària.

Wald DS, et al; PRAMI Investigators. Randomized trial of preventive angioplasty in myocardial infarction. N Engl J Med. 2013;369:1115-23.

The PRAMI trial

Table 1. Characteristics of the Patients at Baseline.*

Characteristic	Preventive PCI (N=234)	No Preventive PCI (N=231)
Mean age (range) — yr	62 (32–92)	62 (33–90)
Sex — no. (%)		
Male	177 (76)	186 (81)
Female	57 (24)	45 (19)
Medical history — no. (%)		
Diabetes	35 (15)	48 (21)
Hypertension	94 (40)	93 (40)
Current smoker	118 (50)	103 (45)
Previous stroke	10 (4)	10 (4)
Previous myocardial infarction	19 (8)	16 (7)
Mean blood pressure — mm Hg		
Systolic	136±26	134±26
Diastolic	81±14	80±15
Infarct location — no. (%)†		
Anterior	67 (29)	89 (39)
Inferior	154 (66)	128 (55)
Lateral	10 (4)	14 (6)
Left bundle-branch block — no. (%)	3 (1)	0
Arteries with stenosis — no. (%)		
2	143 (61)	155 (67)
3	91 (39)	76 (33)
Proximal or mid portion of left anterior descending coronary artery — no. (%)	61 (26)	74 (32)

Wald DS, et al; PRAMI Investigators. Randomized trial of preventive angioplasty in myocardial infarction. N Engl J Med. 2013;369:1115-23.

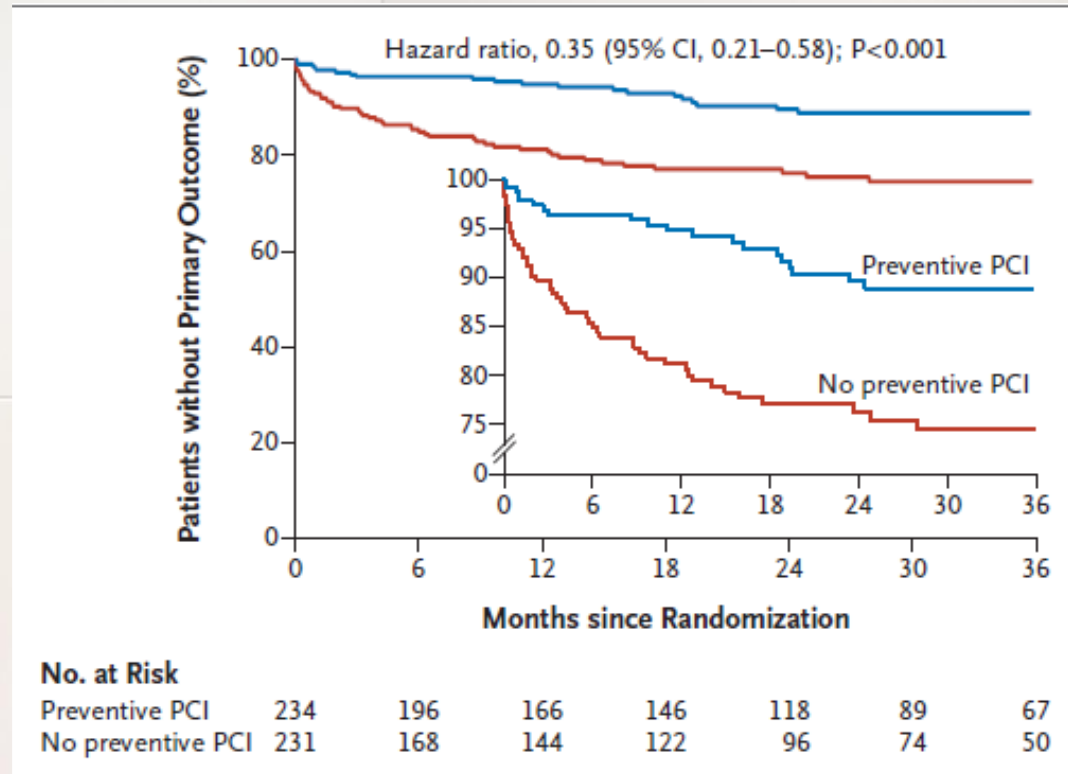
The PRAMI trial

Table 3. Prespecified Clinical Outcomes.*

Outcome	Preventive PCI (N = 234)	No Preventive PCI (N = 231)	Hazard Ratio (95% CI)	P Value
<i>no. of events</i>				
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

Wald DS, et al; PRAMI Investigators. Randomized trial of preventive angioplasty in myocardial infarction. N Engl J Med. 2013;369:1115-23.

The PRAMI trial



Wald DS, et al; PRAMI Investigators. Randomized trial of preventive angioplasty in myocardial infarction. *N Engl J Med*. 2013;369:1115-23.

DANAMI-3 PRIMULTI

- 627 patients amb IAMEST sotmesos a ICP primari i malaltia multivès aleatoritzats a ICP guiat per FFR (n=314) vs no revascularització addicional (n=313)
- Endpoint primari mort global, IAM, revascularització guiada per isquèmia

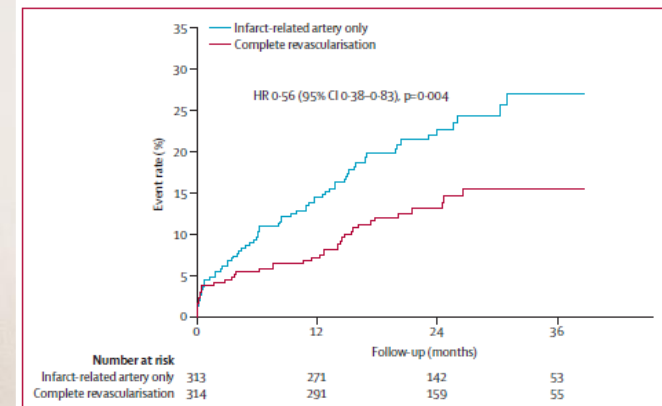


Figure 2: Event rates of the combined primary endpoint
Follow-up was for 44 months after primary percutaneous coronary intervention. HR=hazard ratio.

	Infarct-related artery only (n=313)	Complete revascularisation (n=314)	Hazard ratio (95% CI)	p
Primary endpoint*	68 (22%)	40 (13%)	0.56 (0.38-0.83)	0.004
All-cause mortality	11 (4%)	15 (5%)	1.40 (0.63-3.00)	0.43
Non-fatal reinfarction	16 (5%)	15 (5%)	0.94 (0.47-1.90)	0.87
Ischaemia-driven revascularisation	52 (17%)	17 (5%)	0.31 (0.18-0.53)	<0.0001
Secondary endpoints				
Cardiac death	9 (3%)	5 (2%)	0.56 (0.19-1.70)	0.29
Cardiac death or non-fatal myocardial infarction	25 (8%)	20 (6%)	0.80 (0.45-1.45)	0.47
Urgent percutaneous coronary intervention	18 (6%)	7 (2%)†	0.38 (0.16-0.92)	0.03
Non-urgent percutaneous coronary intervention	27 (9%)	8 (3%)	0.29 (0.13-0.63)	0.002
Unplanned coronary-artery bypass graft surgery	7 (2%)	3 (1%)	0.43 (0.11-1.70)	0.22

Engstrøm T, et al; DANAMI-3—PRIMULTI Investigators. Complete revascularisation versus treatment of the culprit lesion only in patients with ST-segment elevation myocardial infarction and multivessel disease (DANAMI-3—PRIMULTI): an open-label, randomised controlled trial. Lancet. 2015 Aug 15;386(9994):665-71.

COMPARE ACUTE



PROGRAMA
SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
2022-2023

- 885 patients amb IAMEST sotmesos a ICP primari i malaltia multivàs aleatoritzats (1:2) a ICP guiat per FFR (n=295) vs no revascularització addicional (n=590).
- Endpoint primari mort global, IAM, revascularització o ictus a 12m.

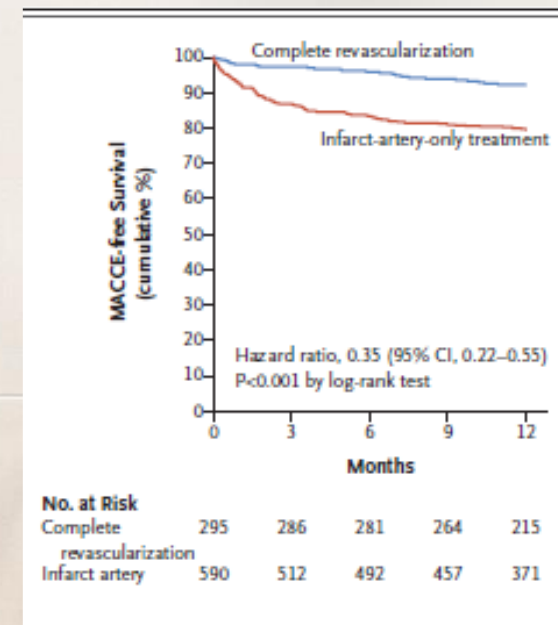
Table 1. Characteristics of the Patients at Baseline.*

Characteristic	Complete Revascularization (N=295)	Infarct-Artery-Only Treatment (N=590)	P Value
Age — yr	62±10	61±10	0.22
BMI†			0.79
Median	27.2	27.1	
Range	18.0–44.1	17.7–54.3	
Male sex — no. (%)	233 (79.0)	450 (76.3)	0.37
White race — no./total no. (%)	263/295 (89.2)	545/589 (92.5)	0.09
Medical history			
Diabetes — no. (%)	43 (14.6)	94 (15.9)	0.60
Hypertension — no. (%)	136 (46.1)	282 (47.8)	0.63
Current smoker — no./total no. (%)	120/294 (40.8)	287/589 (48.7)	0.03
Hypercholesterolemia — no. (%)‡	95 (32.2)	176 (29.8)	0.47
Family history of premature coronary artery disease — no./total no. (%)	103/294 (35.0)	223/590 (37.8)	0.42
Previous stroke — no. (%)	10 (3.4)	26 (4.4)	0.47
Previous myocardial infarction — no. (%)	22 (7.5)	48 (8.1)	0.73
Previous PCI — no. (%)	25 (8.5)	44 (7.5)	0.60
Renal impairment — no. (%)§	3 (1.0)	7 (1.2)	0.82
Peripheral-vessel disease — no. (%)	10 (3.4)	23 (3.9)	0.71
Location of infarct — no. (%)¶			
Posterior	53 (18.0)	96 (16.3)	0.53
Anterior	105 (35.6)	206 (34.9)	0.84
Inferior	149 (50.5)	307 (52.0)	0.67
Lateral	41 (13.9)	86 (14.6)	0.79
Impossible to determine	3 (1.0)	4 (0.7)	0.59
Time from symptom onset to primary PCI — no. (%)			0.58
<6 hr	225 (76.3)	462 (78.3)	
6–12 hr	47 (15.9)	84 (14.2)	
>12 hr	23 (7.8)	44 (7.5)	
Arteries with stenosis — no. (%)			0.54
2	204 (69.2)	396 (67.1)	
3	91 (30.8)	194 (32.9)	
Killip class ≥2 — no. (%)	15 (5.1)	30 (5.1)	1.00
Maximum creatine kinase level (IU/liter)			0.62
Median	1040	1125	
Range	102–8182	112–11,052	

Smits PC, et al; Compare-Acute Investigators. Fractional Flow Reserve-Guided Multivessel Angioplasty in Myocardial Infarction. N Engl J Med. 2017;376:1234-1244.

Table 3. Prespecified Clinical End Points at 1 Year.

End Point	Complete Revascularization (N=295) number (percent)	Infarct-Artery-Only Treatment (N=590) number (percent)	Hazard Ratio (95% CI)	P Value
Primary				
MACCE*	23 (7.8)	121 (20.5)	0.35 (0.22–0.55)	<0.001
Death from any cause	4 (1.4)	10 (1.7)	0.80 (0.23–2.36)	0.70
Cardiac event	3 (1.0)	6 (1.0)	1.00 (0.25–4.01)	1.00
Myocardial infarction	7 (2.4)	28 (4.7)	0.50 (0.22–1.13)	0.10
Spontaneous event	5 (1.7)	17 (2.9)	0.59 (0.22–1.59)	0.29
Periprocedural event	2 (0.7)	11 (1.9)	0.36 (0.08–1.64)	0.19
Revascularization	18 (6.1)	103 (17.5)	0.32 (0.20–0.54)	<0.001
PCI	15 (5.1)	98 (16.6)	0.37 (0.24–0.57)	<0.001
Coronary-artery bypass graft	3 (1.0)	5 (0.8)	1.20 (0.29–5.02)	0.80
Cerebrovascular event	0	4 (0.7)	NA	NA
Secondary				
NACE (any first event)	25 (8.5)	174 (29.5)	0.25 (0.16–0.38)	<0.001
Death from any cause) or myocardial infarction	11 (3.7)	38 (6.4)	0.57 (0.29–1.12)	0.10
Major bleeding	3 (1.0)	8 (1.4)	0.75 (0.20–2.84)	0.67
Any bleeding				
At 12 mo	9 (3.1)	28 (4.7)	0.64 (0.30–1.36)	0.25
At 48 hr	5 (1.7)	8 (1.4)	1.25 (0.41–3.83)	0.69
Hospitalization for heart failure, unstable angina, or chest pain	13 (4.4)	47 (8.0)	0.54 (0.29–0.99)	0.04
Any revascularization†	19 (6.4)	161 (27.3)	0.47 (0.29–0.76)	0.002
Stent thrombosis	2 (0.7)	1 (0.2)	0.58 (0.12–2.80)	0.50



Smits PC, et al; Compare-Acute Investigators. Fractional Flow Reserve-Guided Multivessel Angioplasty in Myocardial Infarction. N Engl J Med. 2017;376:1234-1244.

The COMPLETE trial



PROGRAMA
SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
2022-2023

- 4041 pacients amb IAMEST i malaltia multivàs sotmesos a ICP primari exitós a lesió culpable en fase aguda.
- Aleatoritzats a ICP a la resta de lesions significatives no culpables (n=2016) vs no revascularització addicional (n=2025)
- Revascularització durant l'ingrés o en els primers 45d de l'alta.
- Outcome comprimari: mort cardiovascular o infart de miocardi. Segon outcome coprimari mort cardiovascular, IAM o revascularització guiada per isquèmia.

Mehta SR, et al; COMPLETE Trial Steering Committee and Investigators. Complete Revascularization with Multivessel PCI for Myocardial Infarction. N Engl J Med. 2019;381:1411-1421.

The COMPLETE trial

Table 1. Characteristics of the Patients at Baseline.*

Characteristic	Complete Revascularization (N=2016)	Culprit-Lesion-Only PCI (N=2025)
Age—yr	61.6±10.7	62.4±10.7
Male sex—no. (%)	1623 (80.5)	1602 (79.1)
Diabetes—no. (%)	385 (19.1)	402 (19.9)
Chronic renal insufficiency—no./total no. (%)	37/1884 (2.0)	44/1903 (2.3)
Previous myocardial infarction—no. (%)	148 (7.3)	154 (7.6)
Current smoker—no. (%)	819 (40.6)	787 (38.9)
Hypertension—no. (%)	982 (48.7)	1027 (50.7)
Dyslipidemia—no. (%)	764 (37.9)	797 (39.4)
Previous PCI—no. (%)	142 (7.0)	141 (7.0)
Previous stroke—no. (%)	64 (3.2)	62 (3.1)
Time from symptom onset to index PCI—no./total no. (%)		
<6 hr	1383/1994 (69.4)	1341/2000 (67.0)
6 to 12 hr	322/1994 (16.1)	354/2000 (17.7)
>12 hr	289/1994 (14.5)	305/2000 (15.2)
Killip class ≥II—no./total no. (%)	212/1995 (10.6)	218/1996 (10.9)
Glycated hemoglobin—%	6.3±1.6	6.3±1.6
Low-density lipoprotein cholesterol—mmol/liter	3.1±1.2	3.1±1.2
Peak creatinine—μmol/liter	84.7±30.8	85.2±26.8
Medications at discharge—no. (%)		
Aspirin	2011 (99.8)	2015 (99.5)
P2Y ₁₂ inhibitor		
Any	2003 (99.4)	2018 (99.7)
Ticagrelor	1298 (64.4)	1281 (63.3)
Prasugrel	193 (9.6)	169 (8.3)
Clopidogrel	516 (25.6)	572 (28.2)
Beta-blocker	1776 (88.1)	1804 (89.1)
Angiotensin-converting-enzyme inhibitor or angiotensin-receptor blocker	1723 (85.5)	1714 (84.6)
Statin	1980 (98.2)	1968 (97.2)

Revascularització completa:
1285 pacients durant l'ingrés
(mediana un dia) i 596 més
enllà de l'alta (mediana 23d)

Mehta SR, et al; COMPLETE Trial Steering Committee and Investigators. Complete Revascularization with Multivessel PCI for Myocardial Infarction. N Engl J Med. 2019;381:1411-1421.

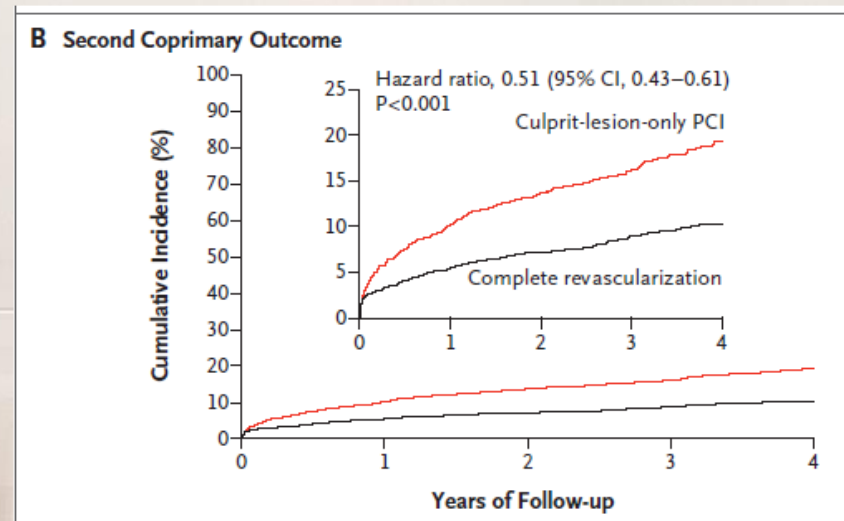
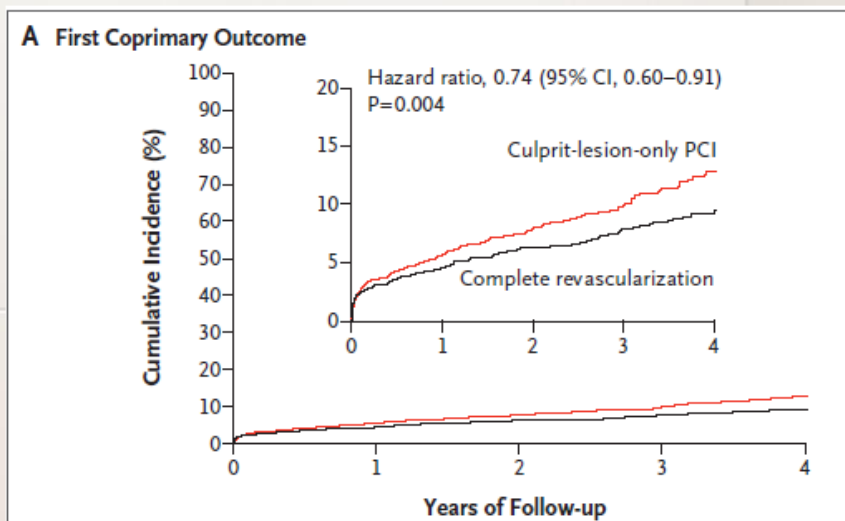
The COMPLETE trial

Table 3. Efficacy and Safety Outcomes.*

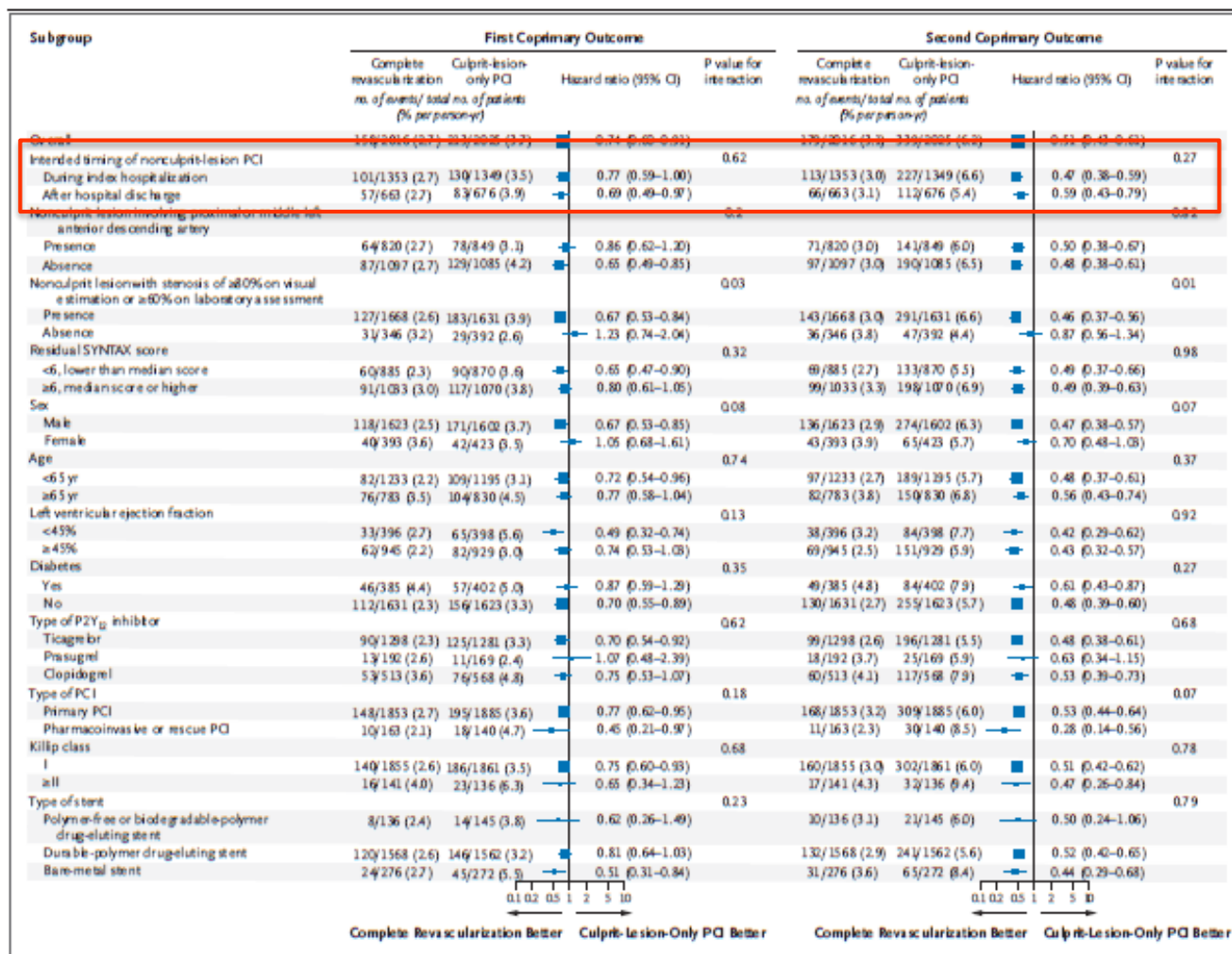
Outcome	Complete Revascularization (N = 2016)		Culprit-Lesion-Only PCI (N = 2025)		Hazard Ratio (95% CI)	P Value
	no. (%)	% per person-yr	no. (%)	% per person-yr		
Co-primary outcomes						
Cardiovascular death or myocardial infarction	158 (7.8)	2.7	213 (10.5)	3.7	0.74 (0.60–0.91)	0.004
Cardiovascular death, myocardial infarction, or ischemia-driven revascularization	179 (8.9)	3.1	339 (16.7)	6.2	0.51 (0.43–0.61)	<0.001
Key secondary outcome						
Cardiovascular death, myocardial infarction, ischemia-driven revascularization, unstable angina, or NYHA class IV heart failure	272 (13.5)	4.9	426 (21.0)	8.1	0.62 (0.53–0.72)	
Other secondary outcomes						
Myocardial infarction	109 (5.4)	1.9	160 (7.9)	2.8	0.68 (0.53–0.86)	
Ischemia-driven revascularization	29 (1.4)	0.5	160 (7.9)	2.8	0.18 (0.12–0.26)	
Unstable angina	70 (3.5)	1.2	130 (6.4)	2.2	0.53 (0.40–0.71)	
Death from cardiovascular causes	59 (2.9)	1.0	64 (3.2)	1.0	0.93 (0.65–1.32)	
Death from any cause	96 (4.8)	1.6	106 (5.2)	1.7	0.91 (0.69–1.20)	
Other outcomes						
Stroke	38 (1.9)	0.6	29 (1.4)	0.5	1.31 (0.81–2.13)	
NYHA class IV heart failure	58 (2.9)	1.0	56 (2.8)	0.9	1.04 (0.72–1.50)	
Stent thrombosis	26 (1.3)	0.4	19 (0.9)	0.3	1.38 (0.76–2.49)	
Safety outcomes						
Major bleeding	58 (2.9)	1.0	44 (2.2)	0.7	1.33 (0.90–1.97)	0.15
Contrast-associated acute kidney injury†	30 (1.5)	—	19 (0.9)	—	1.59 (0.89–2.84)	0.11

Mehta SR, et al; COMPLETE Trial Steering Committee and Investigators. Complete Revascularization with Multivessel PCI for Myocardial Infarction. N Engl J Med. 2019;381:1411-1421.

The COMPLETE trial



Mehta SR, et al; COMPLETE Trial Steering Committee and Investigators. Complete Revascularization with Multivessel PCI for Myocardial Infarction. N Engl J Med. 2019;381:1411-1421.

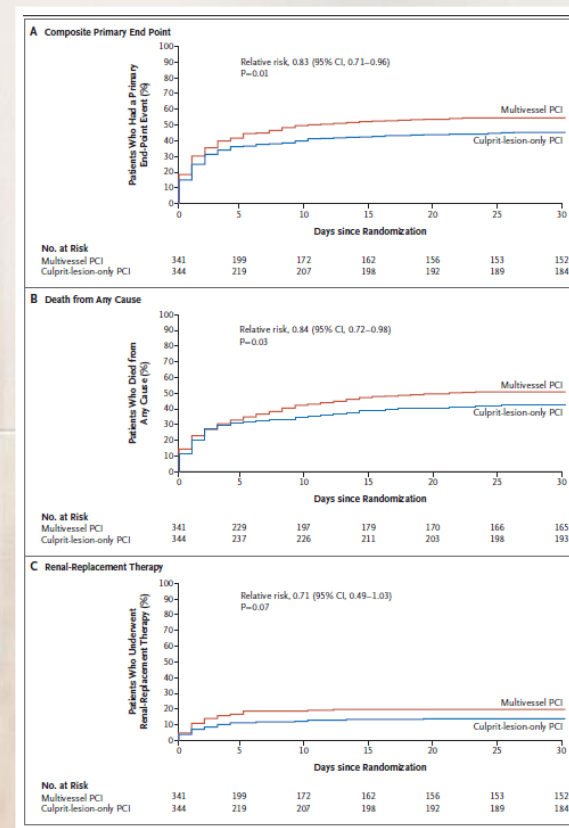


Yeh RW, et al; DAPT Study Investigators. Development and Validation of a Prediction Rule for Benefit and Harm of Dual Antiplatelet Therapy Beyond 1 Year After Percutaneous Coronary Intervention. JAMA. 2016;315:1735-49.

I en el pacient amb shock?

CULPRIT SHOCK trial

- 706 patients amb IAMEST amb shock sotmesos a ICP primari i malaltia multivàs aleatoritzats a ICP amb revascularització complerta (n=341) vs no revascularització addicional (n=344).
- Endpoint primari mort global o fracàs renal requerint depuració extrarrenal a 30 d.



Thiele H, et al; CULPRIT-SHOCK Investigators. PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock. N Engl J Med. 2017 Dec 21;377(25):2419-2432.

“Staged revascularization procedures were encouraged on the basis of the presence of residual ischemic lesions (evaluated by means of noninvasive testing or with the use of fractional flow reserve [FFR]), symptoms, and clinical and neurologic status”

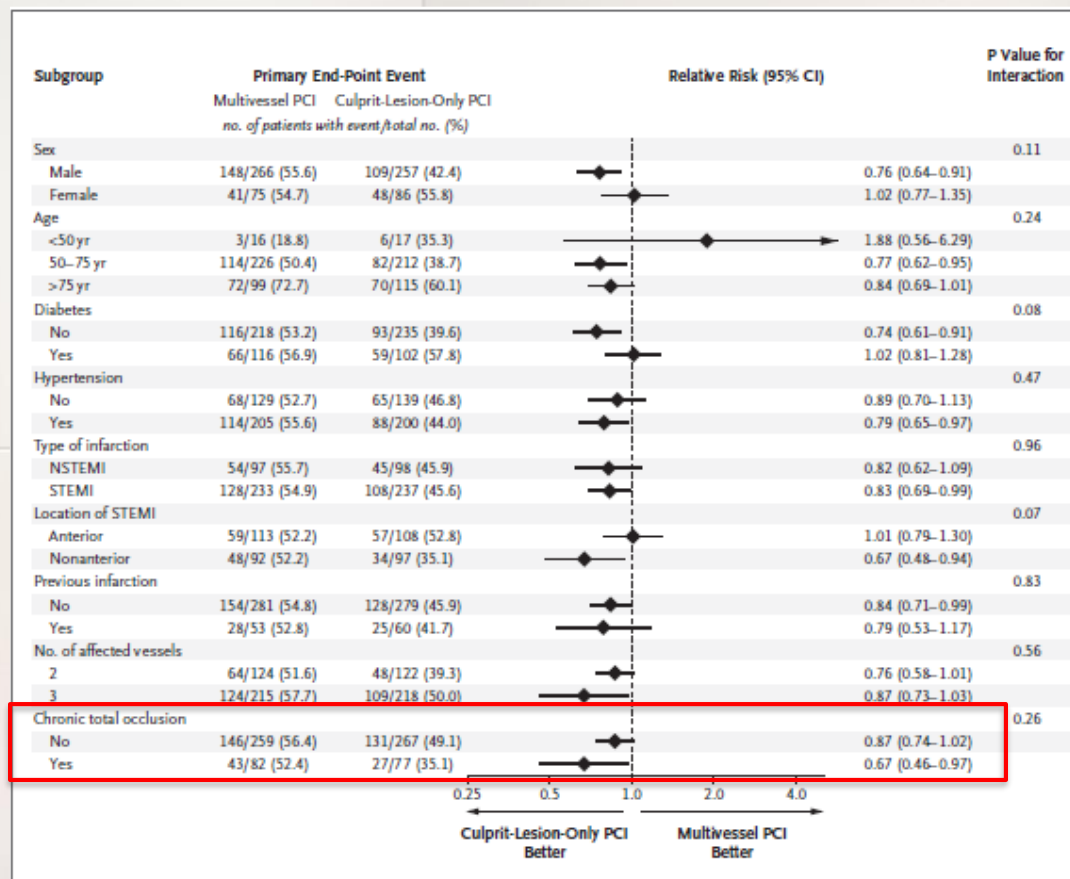
Thiele H, et al; CULPRIT-SHOCK Investigators. PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock. N Engl J Med. 2017 Dec 21;377(25):2419-2432.

Characteristic	Culprit-Lesion-Only PCI Group (N=344)	Multivessel PCI Group (N=342)
Heart rate — beats/min		
Median	90	91
Interquartile range	73–109	72–107
Creatinine — mg/dL†		
Median	1.17	1.20
Interquartile range	0.90–1.66	0.90–1.68
Creatinine clearance — mL/min		
Median	64	66
Interquartile range	42–95	43–93
No. of affected vessels — no./total no. (%)		
1	3/343 (0.9)	2/342 (0.6)
2	122/343 (35.6)	124/342 (36.3)
3	218/343 (63.6)	216/342 (63.2)
Vessel related to the infarction — no./total no. (%)		
Left anterior descending artery	132/343 (38.5)	156/342 (45.6)
Left circumflex artery	76/343 (22.2)	70/342 (20.5)
Right coronary artery	102/343 (29.7)	89/342 (26.0)
Left main artery	31/343 (9.0)	22/342 (6.4)
Bypass graft	2/343 (0.6)	5/342 (1.5)
≥1 Chronic total occlusion — no./total no. (%)	77/344 (22.4)	82/342 (24.0)
Left ventricular ejection fraction — %		
Median	33	30
Interquartile range	25–40	21–40

Table 2. Procedural Characteristics.

Variable	Culprit-Lesion-Only PCI Group (N=344)	Multivessel PCI Group (N=342)	P Value
Arterial access — no./total no. (%)			
Femoral	287/343 (83.7)	277/342 (81.0)	0.36
Radial	61/343 (17.8)	66/342 (19.3)	0.61
Brachial	2/343 (0.6)	1/342 (0.3)	>0.99
Stent in culprit lesion — no./total no. (%)			
Any	326/343 (95.0)	324/342 (94.7)	0.86
Bare metal	20/326 (6.1)	17/324 (5.2)	0.63
Drug eluting	305/326 (93.6)	308/324 (95.1)	0.41
Bioresorbable scaffold in culprit lesion — no./total no. (%)	2/326 (0.6)	3/324 (0.9)	0.69
Aspiration thrombectomy of culprit lesion — no./total no. (%)	60/343 (17.5)	39/342 (11.4)	0.02*
TIMI grade for blood flow — no./total no. (%)†			
Before PCI of culprit lesion			
0	189/339 (55.8)	178/337 (52.8)	
I	37/339 (10.9)	45/337 (13.4)	
II	56/339 (16.5)	50/337 (14.8)	
III	57/339 (16.8)	64/337 (19.0)	0.49
After PCI of culprit lesion			
0	13/342 (3.8)	16/338 (4.7)	
I	12/342 (3.5)	8/338 (2.4)	
II	28/342 (8.2)	21/338 (6.2)	
III	289/342 (84.5)	293/338 (86.7)	0.46
Immediate PCI of nonculprit lesions — no./total no. (%)	43/344 (12.5)	310/342 (90.6)	<0.001
Immediate complete revascularization achieved — no./total no. (%)	26/344 (7.6)	277/342 (81.0)	<0.001
Total dose of contrast material — mL			<0.001
Median	190	250	
Interquartile range	140–250	200–350	
Total duration of fluoroscopy — min			<0.001
Median	13	19	
Interquartile range	7–20	12–28	
Staged PCI of nonculprit lesions — no./total no. (%)	60/344 (17.4)	8/341 (2.3)	<0.001
Staged coronary artery bypass grafting — no./total no. (%)	3/344 (0.9)	0/341	>0.99
Mechanical circulatory support — no./total no. (%)			
Any	99/344 (28.8)	95/342 (27.8)	0.77
Intraaortic balloon pump	25/99 (25.3)	26/95 (27.4)	0.74
Impella 2.5 percutaneous ventricular assist device	16/99 (16.2)	18/95 (18.9)	0.61
Impella CP percutaneous ventricular assist device	30/99 (30.3)	18/95 (18.9)	0.07
TandemHeart percutaneous ventricular assist device	2/99 (2.0)	0/95	0.50
Extracorporeal membrane oxygenation	18/99 (18.2)	27/95 (28.4)	0.09
Other	12/99 (12.1)	8/95 (8.4)	0.40
Heart transplantation — no./total no. (%)	1/343 (0.3)	0/340	>0.99
Mild hypothermia — no./total no. (%)	111/344 (32.3)	118/340 (34.7)	0.50

Thiele H, et al; CULPRIT-SHOCK Investigators. PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock. *N Engl J Med.* 2017 Dec 21;377(25):2419–2432.



Thiele H, et al; CULPRIT-SHOCK Investigators. PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock. *N Engl J Med.* 2017 Dec 21;377(25):2419-2432.

Conclusions



PROGRAMA
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2022-2023

- Més de la meitat de pacients amb IAMEST presenten malaltia coronària multivàs.
- Aquests pacients presenten una major incidència d'esdeveniments cardiovasculars.
- Els pacients amb major malaltia coronària residual després d'un ICP presenten també major incidència d'esdeveniments.

Conclusions



PROGRAMA
SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
2022-2023

- La revascularització percutània diferida de lesions significatives factibles redueix la incidència d'esdeveniments cardiovasculars en pacients amb IAMEST i malaltia multivàs.
- El benefici sembla independent del moment de la revascularització (durant l'ingrés vs post-alta).
- Alguns escenaris anatòmics requereixen un abordatge diferent (TC, CTO).
- Aspectes a tenir en compte: comorbiditats, contraindicacions antitrombòtics, severitat lesions, complexitat tècnics, localització anatòmica.

Conclusions



PROGRAMA
SESSIONS D'ACTUALITZACIÓ
EN CARDIOLOGIA
2022-2023

- La revascularització complerta rutinària no està indicada en el pacient amb xoc. En algunes lesions proximals severes i tècnicament factibles pot ser raonable la revascularització en fase aguda més enllà de la lesió culpable.
- Possible impacte de FFR i tècniques d'imatge (IVUS, OCT) en lesions no culpables significatives no severes.
- Judici clinic, sentit comú i abordatge multidisciplinar fonamentals en la presa de decisions.

aariza@bellvitgehospital.cat
@AlbertAriza3



Moltes gràcies