Should Cardiac Arrest Survivors Undergo Emergency Coronary Intervention

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- US annual OHCA incidence: 236,000-325,000/yr
- Major causes of death after OHCA:
  - CNS injury
  - Heart failure
- Incidence of coronary disease in OHCA > 70%
- Coronary occlusion in OHCA > 50%

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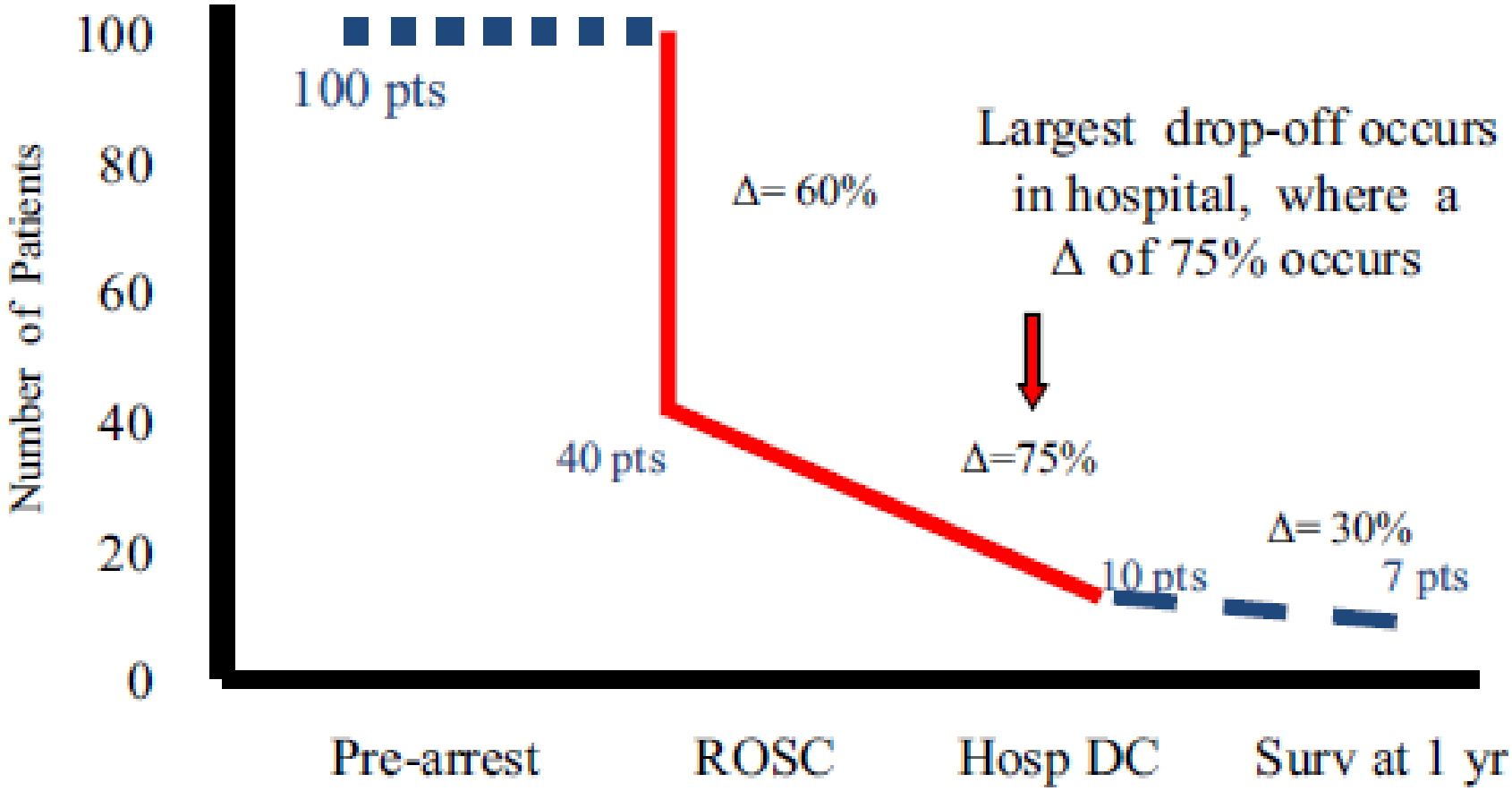
- Assumptions
  - Acute coronary occlusions are the likely trigger of cardiac arrests
  - Emergency angiography & reperfusion may improve outcomes

Long-term survival after OHCA: 5%-10%



Kern JACC Intv 2012 ;5:597

Angiographic Characteristics of Coronary Disease and Postresuscitation Electrocardiograms in Patients With Aborted Cardiac Arrest Outside a Hospital

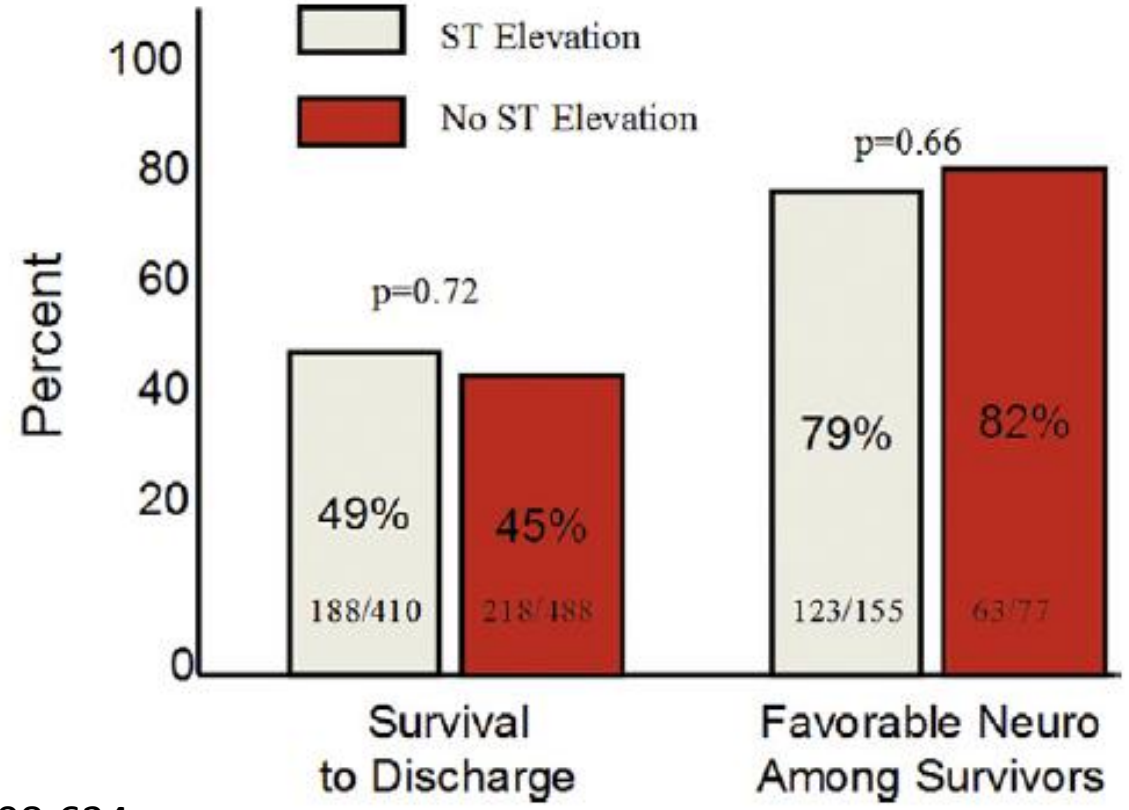
Peter Radsel, MD, Rihard Knafelj, MD, Spela Kocjancic, MD, PhD, and Marko Noc, MD, PhD*

- 212 OHCA patients undergoing angiography
  - 158: ST-segment elevation
  - 54: No ST-segment elevation

ECG findings	% coronary occlusion	% acute occlusions
ST-elevation	97	89
No ST-elevation	59	24

Radsel AJC 2011;108:634

No differences in survival-to-discharge or favorable neurological function between those with or without ST-segment elevation



- Radsel AJC 2011;108:634,
- Dumas Circ Intv 2010;3:200,
- Cronier Crit Care 2011;15:R122
- Mooney Circulation 2011;124:206

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Long-Term Prognosis Following Resuscitation From Out of Hospital Cardiac Arrest

Role of Percutaneous Coronary Intervention and Therapeutic Hypothermia

Florence Dumas, MD, MPH,*†‡ Lindsay White, MPH,* Benjamin A. Stubbs, MPH,* Alain Cariou, MD,†§ Thomas D. Rea, MD, MPH*‖

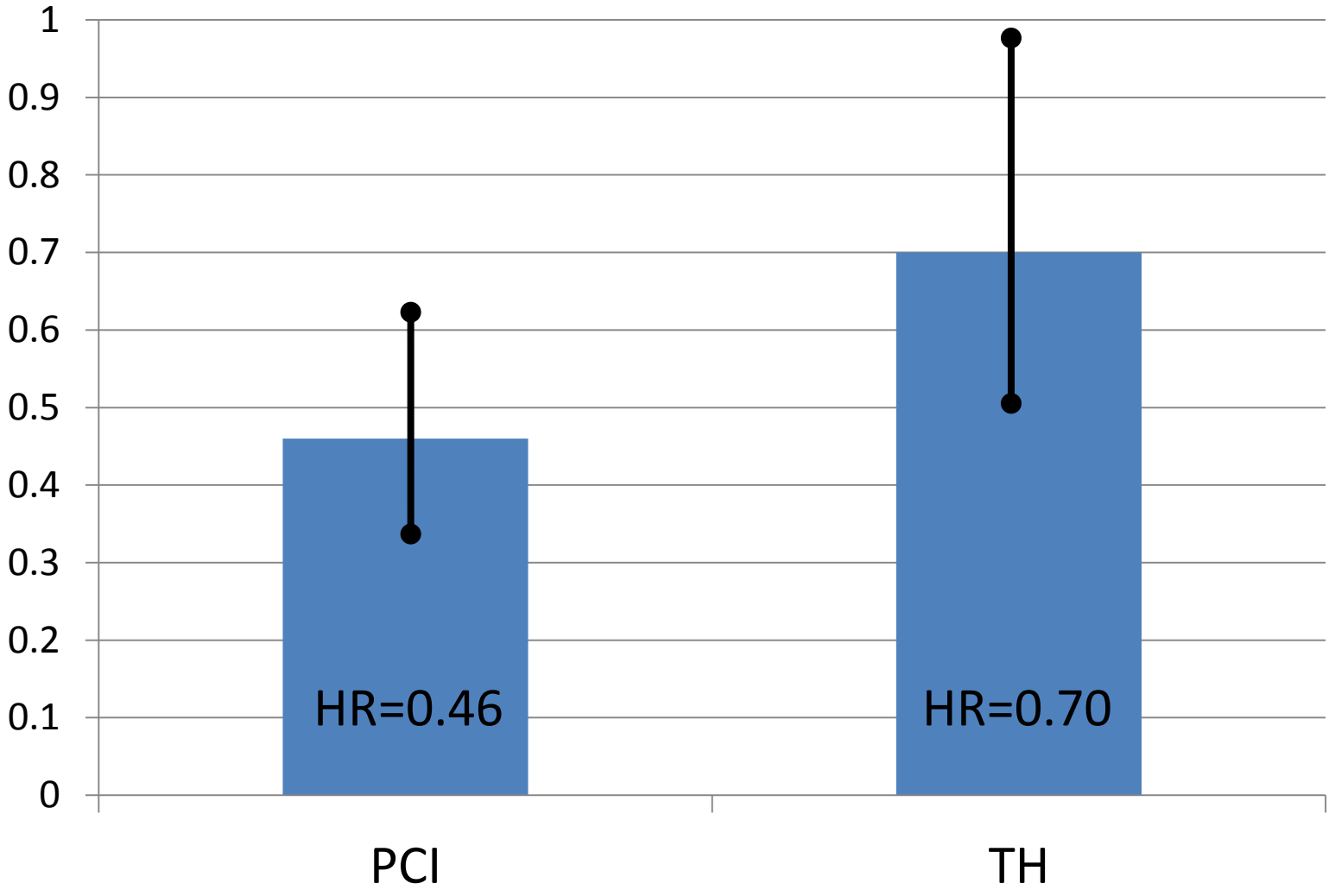
Seattle, Washington; and Paris, France

JACC Intv 2012 ;60:21

5,958 cadiac arrests-Comatose on arrival

1,001 (16.8%) discharged alive

Multivariate analysis: 5 Year mortality



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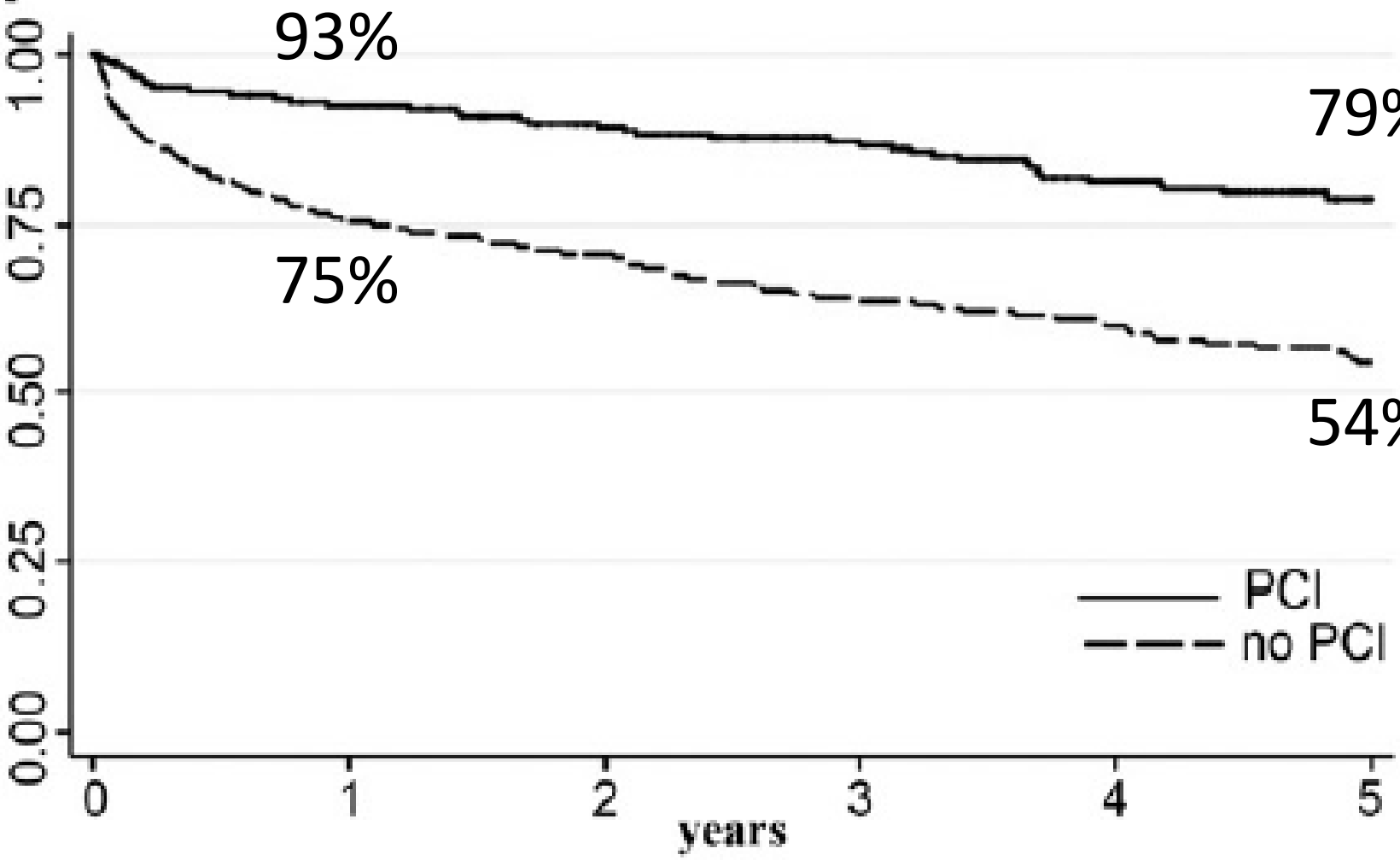
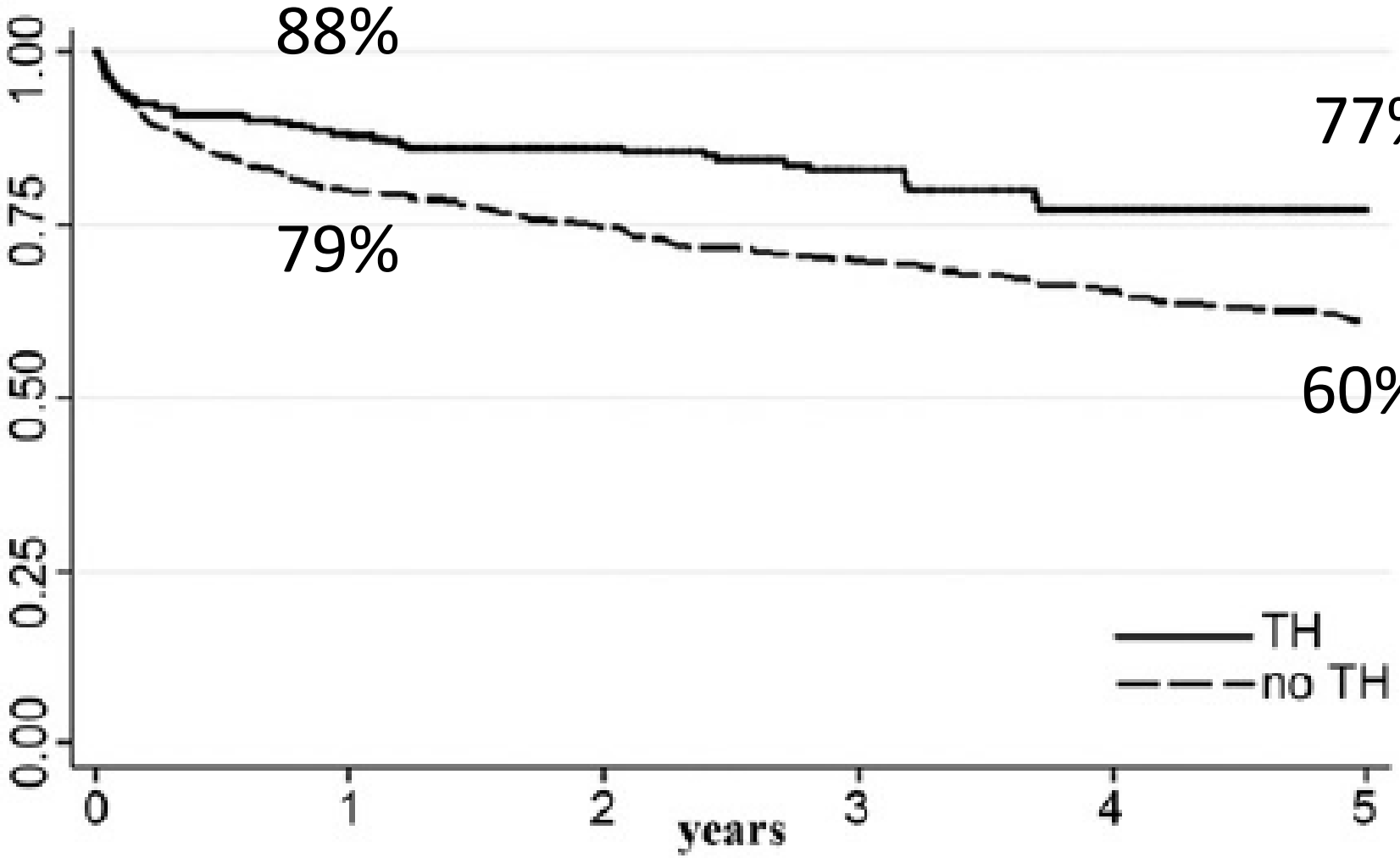


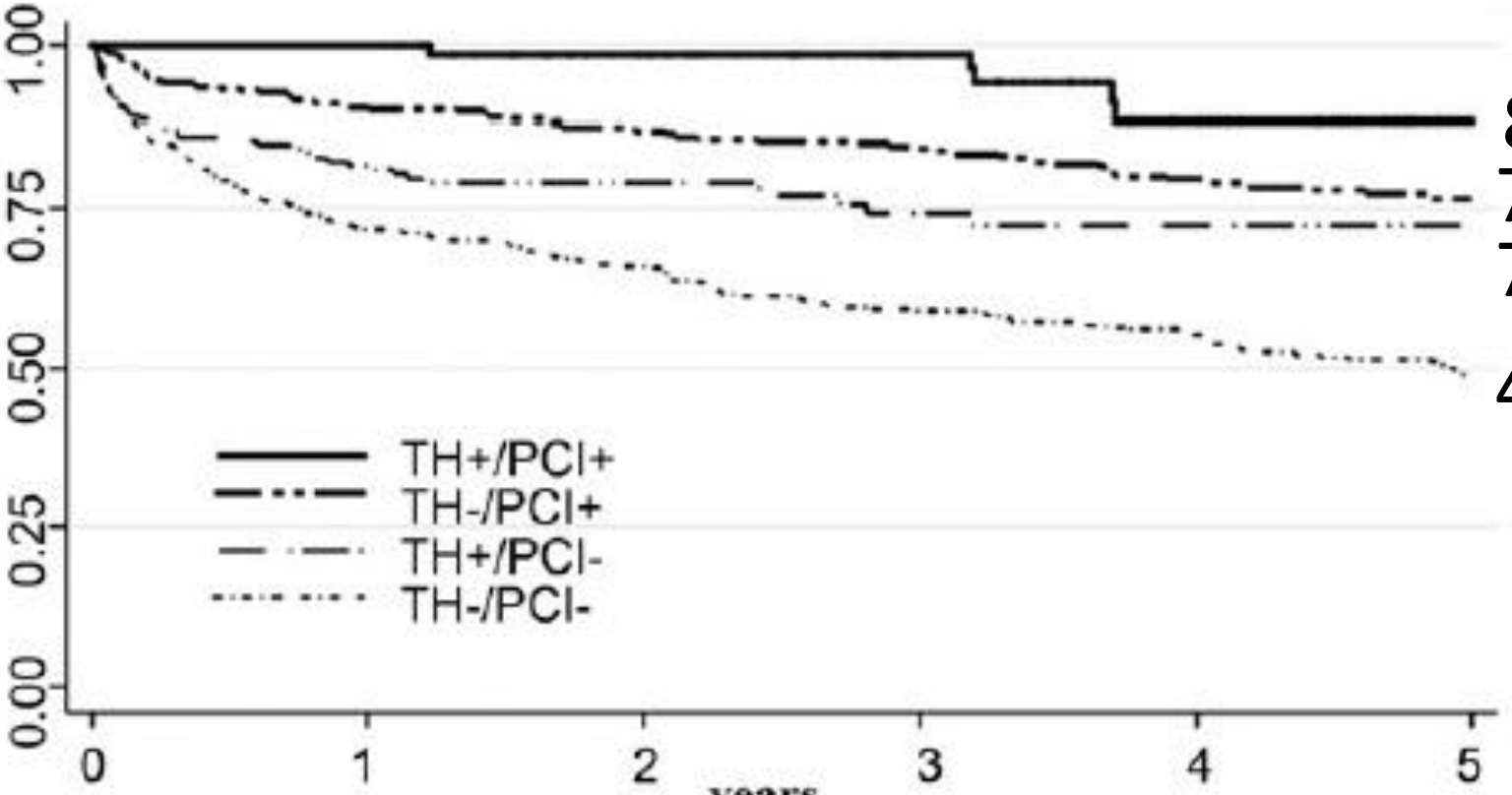
		deaths	Person-year	Survival rate (%)
PCI+	1 year	28	365.1	92.7 (89.6-94.9)
	5 years	71	1429.6	78.7 (73.7-82.8)
PCI-	1 year	152	512.5	75.4 (71.8-78.6)
	5 years	242	1633.1	54.4 (49.7-58.8)

B



		deaths	Person-year	Survival rate (%)
TH+	1 year	30	222.5	87.8 (83.0-91.3)
	5 years	43	631.9	77.5 (69.9-83.3)
TH-	1 year	144	598.2	79.3 (76.1-82.1)
	5 years	260	2309.5	60.4 (56.5-64.1)

C



		deaths	Person-year	Survival rate (%)
PCI+/TH+	1 year	0	86.0	100
	5 years	5	270.0	88.6 (74.2-95.2)
PCI+/TH-	1 year	26	259.9	90.6 (86.5-93.5)
	5 years	62	1119.9	76.5 (70.9-81.2)
PCI-/TH+	1 year	30	137.5	81.1 (74.1-86.4)
	5 years	38	361.9	72.1 (62.7-79.5)
PCI-/TH-	1 year	118	338.3	71.8 (67.3-75.9)
	5 years	198	1189.6	49.2 (44.0-54.3)

CME

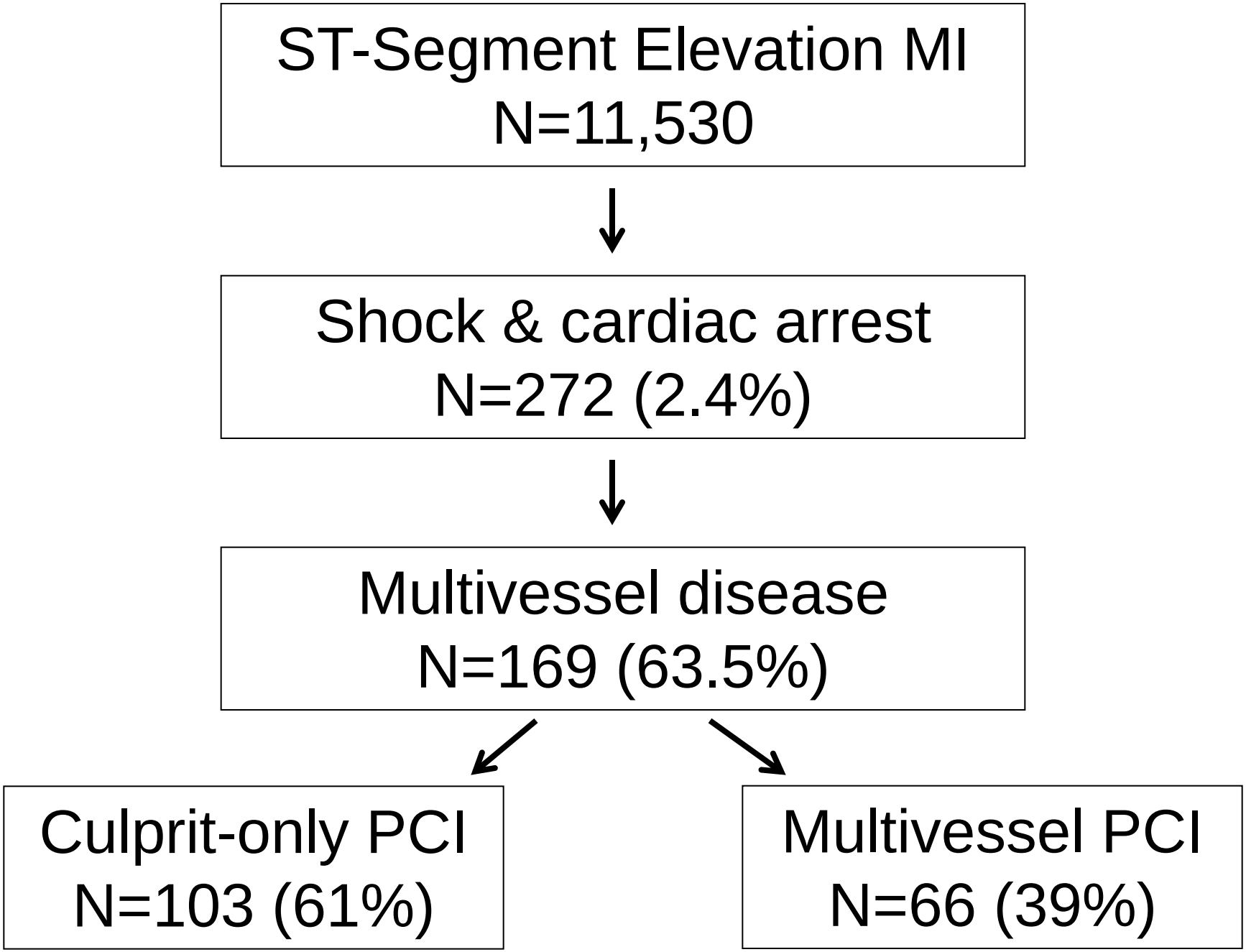
Primary Percutaneous Coronary Intervention in Patients With Acute Myocardial Infarction, Resuscitated Cardiac Arrest, and Cardiogenic Shock

The Role of Primary Multivessel Revascularization

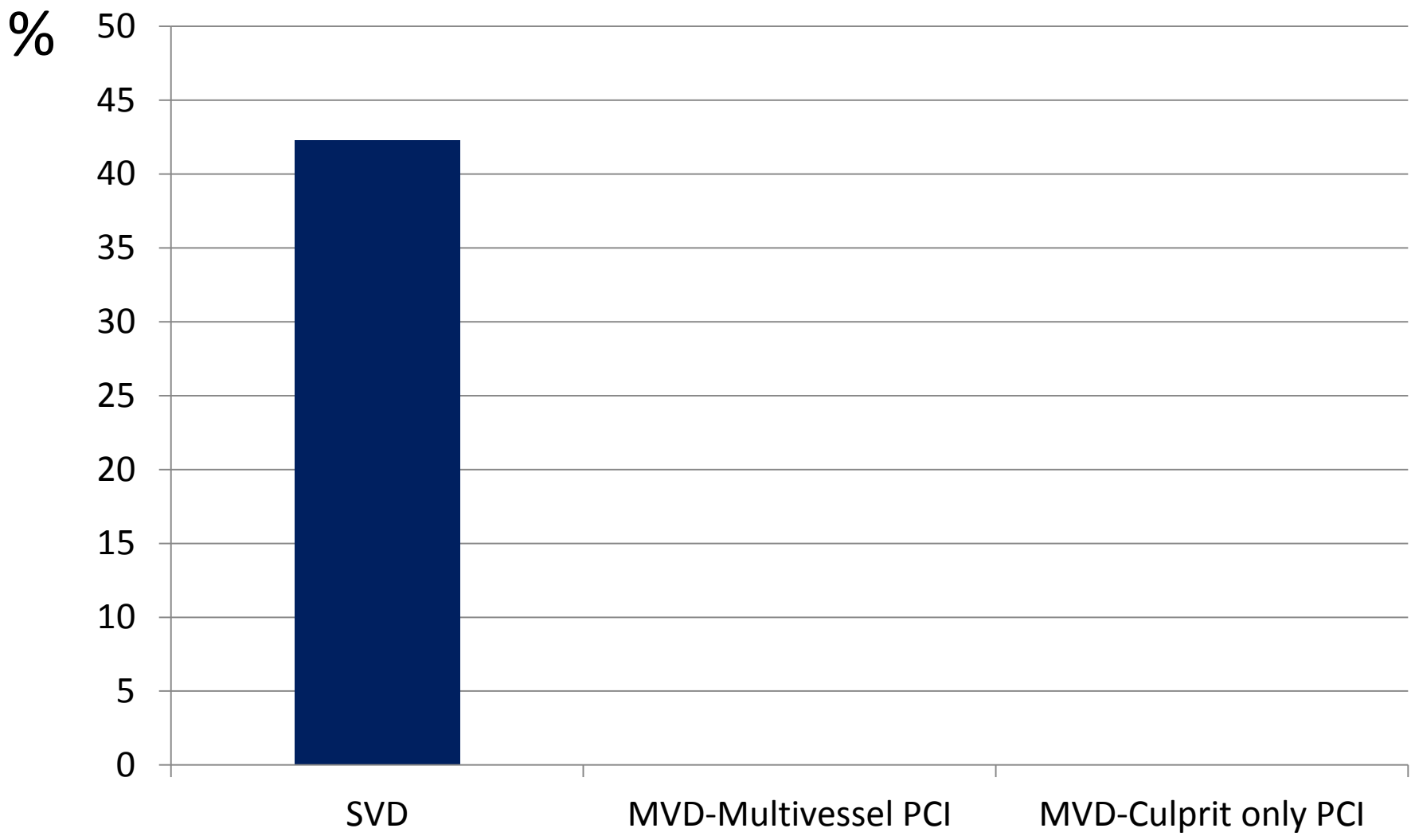
Darren Mylotte, MD,* Marie-Claude Morice, MD,* Hélène Eltchaninoff, MD, PhD,†
Jérôme Garot, MD, PhD,* Yves Louvard, MD,* Thierry Lefèvre, MD,* Philippe Garot, MD*

Massy, Quincy, and Rouen, France

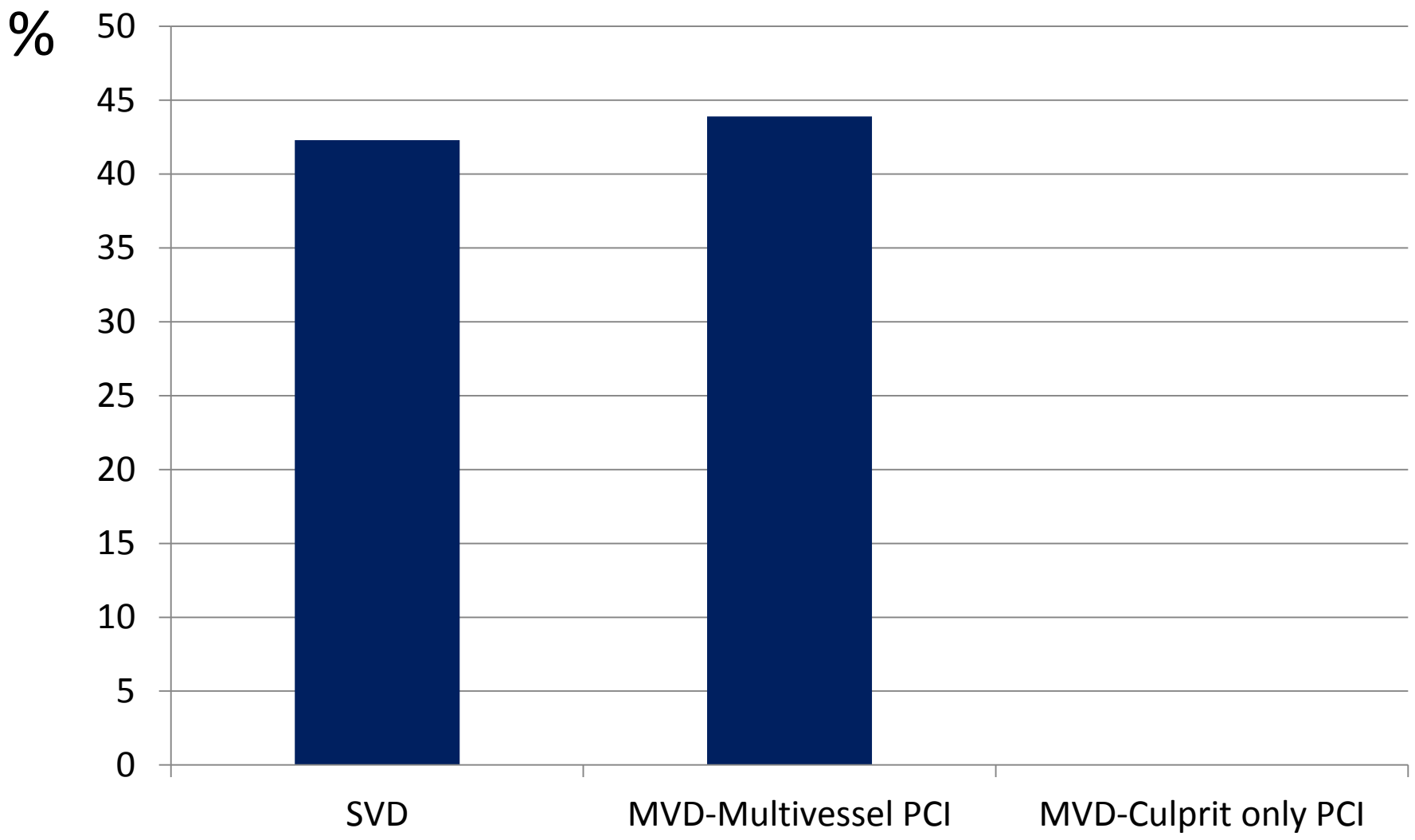
JACC Intv 2013;6:115–25


ST-Segment Elevation MI
N=11,530
Shock & cardiac arrest
N=272 (2.4%)
Multivessel disease
N=169 (63.5%)
Culprit-only PCI
N=103 (61%)
Multivessel PCI
N=66 (39%)

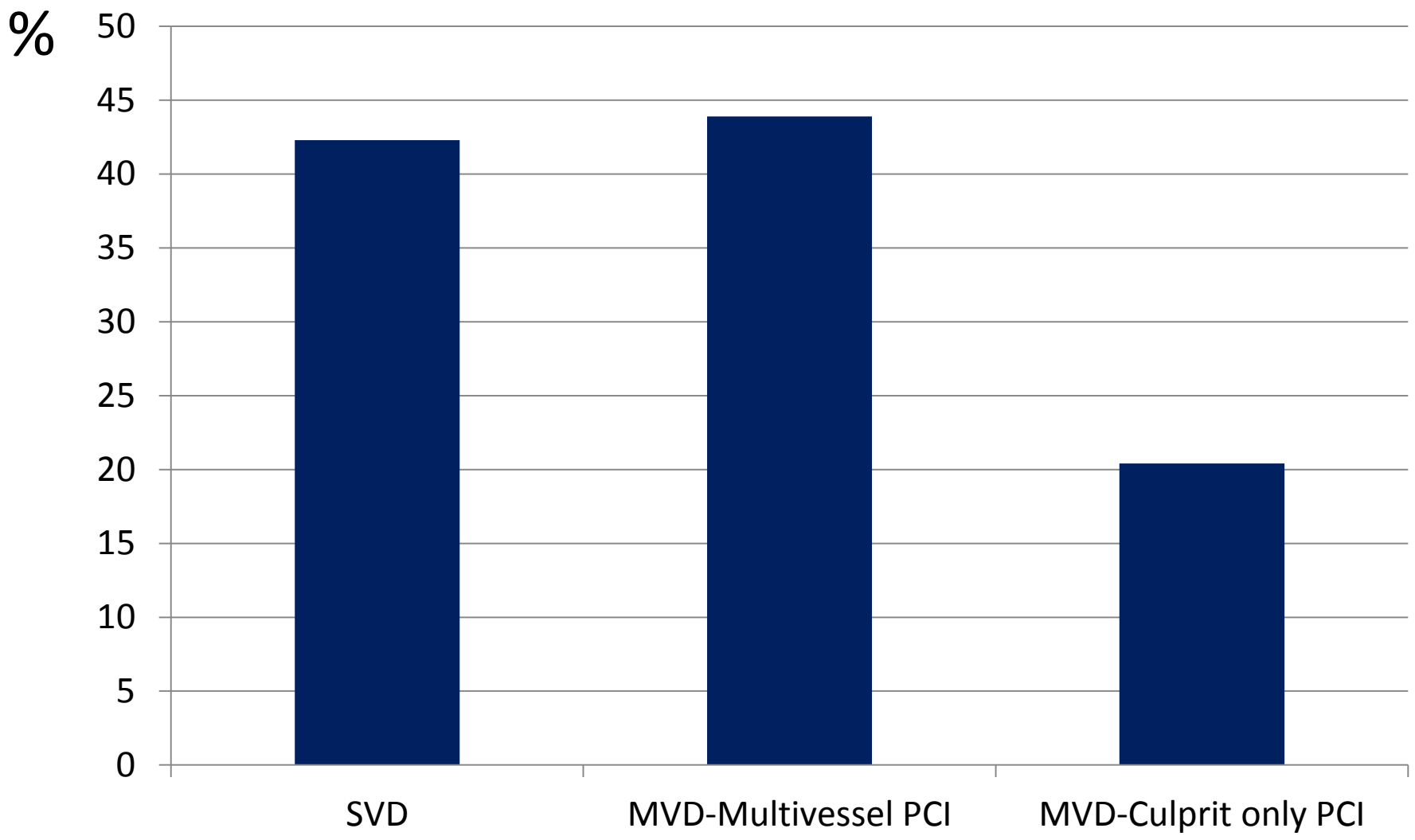
6-month survival



6-month survival



6-month survival



Conclusion

Importance of total revascularization in OHCA

AHA & International Liaison Committee on Resuscitation 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science:

- In OHCA patients with STEMI or new LBBB on ECG after ROSC, early angiography and PPCI should be considered.

O'Connor Circulation 2010;122 Suppl 2:S422– 65

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- In OHCA patients with STEMI or new LBBB on ECG after ROSC, early angiography and PPCI should be considered.
- Out-of hospital cardiac arrest patients are often initially comatose but this should not be a contraindication to consider immediate angiography and PCI.
- It may be reasonable to include cardiac catheterization in a standardized post-cardiac-arrest protocol as part of an overall strategy to improve neurologically intact survival in this patient group"

O'Connor Circulation 2010;122 Suppl 2:S422– 65

EDITORIAL COMMENT

Encouraging (Not Discouraging) Optimal Care for All ST-Segment Elevation Myocardial Infarction Patients*

Unfortunately, such operators and medical centers have found themselves more often penalized than rewarded for their efforts to provide optimal cardiovascular care for such patients. That penalty is manifested in public scorecards, where their reported mortality rates may be substantially higher than for operators or centers that do not provide timely reperfusion for these very sick patients.

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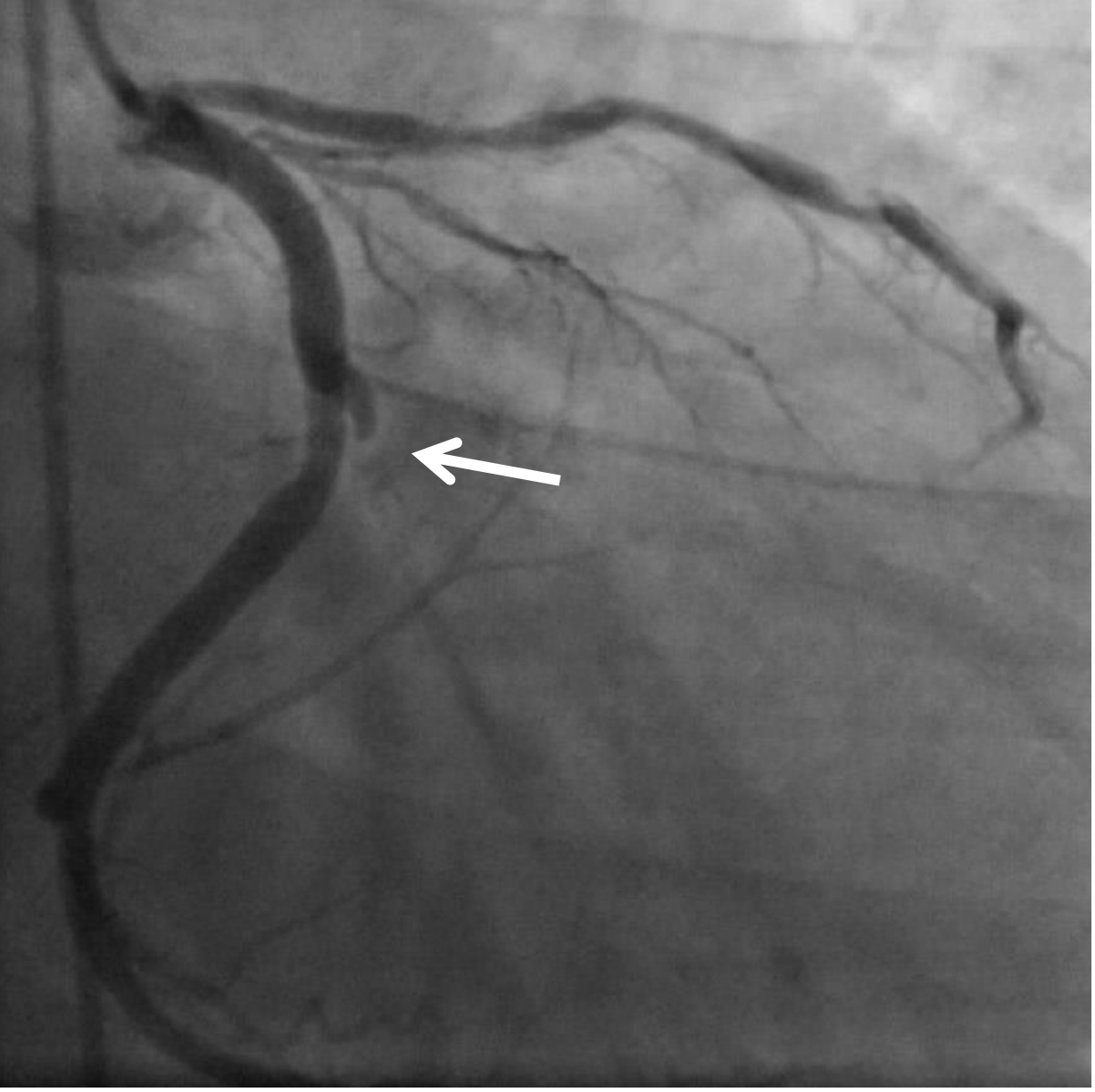
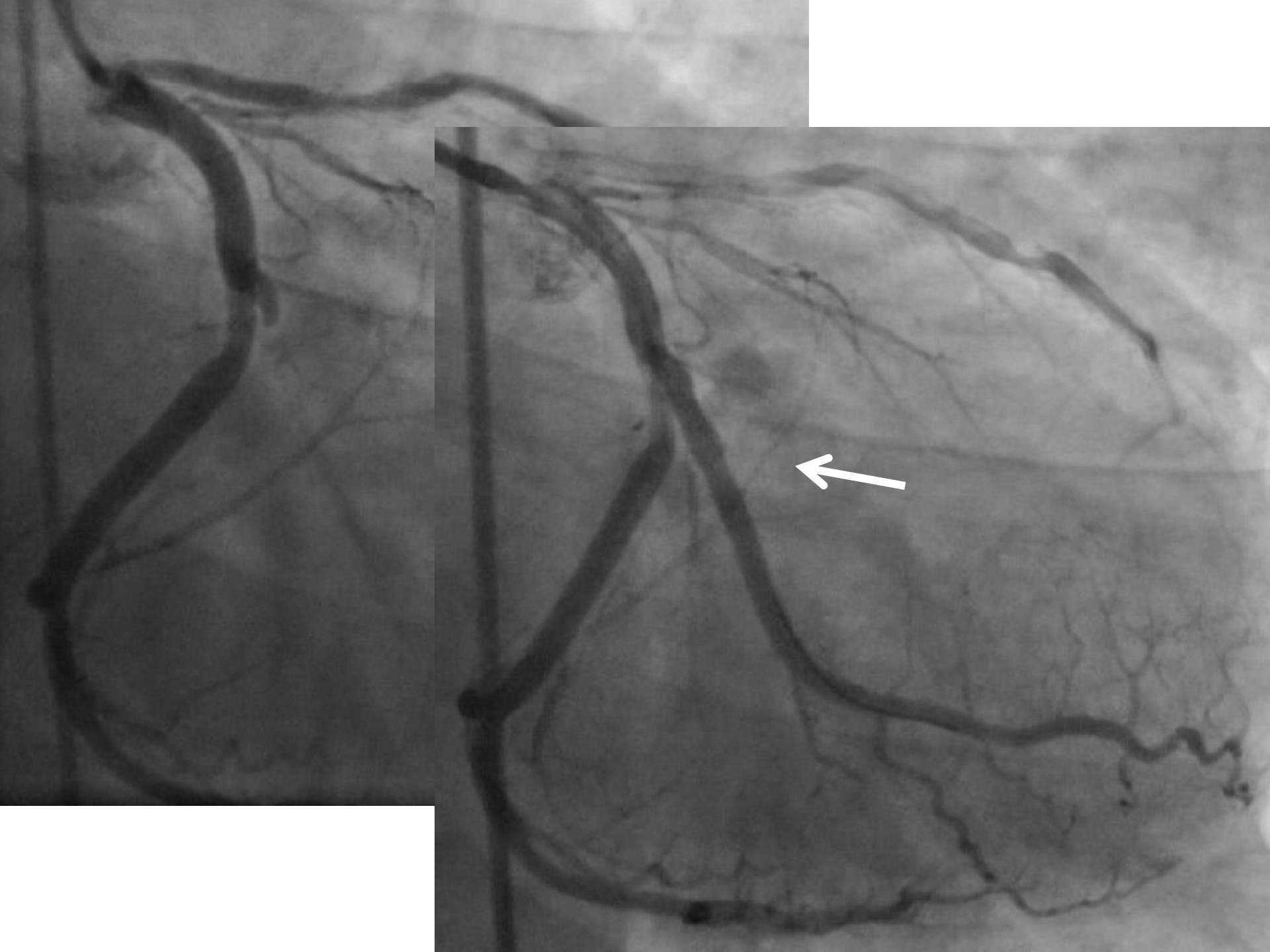
- 49 year old man
- Heavy smoker
- Chest pain
- Witnessed cardiac arrest in the clinic
- Bystander CPR
- Recurrent VF-3 DC shocks
- Arrival at ER:
  - Stupor
  - NSR with recurrent VF
  - BP 80/50 mmHg

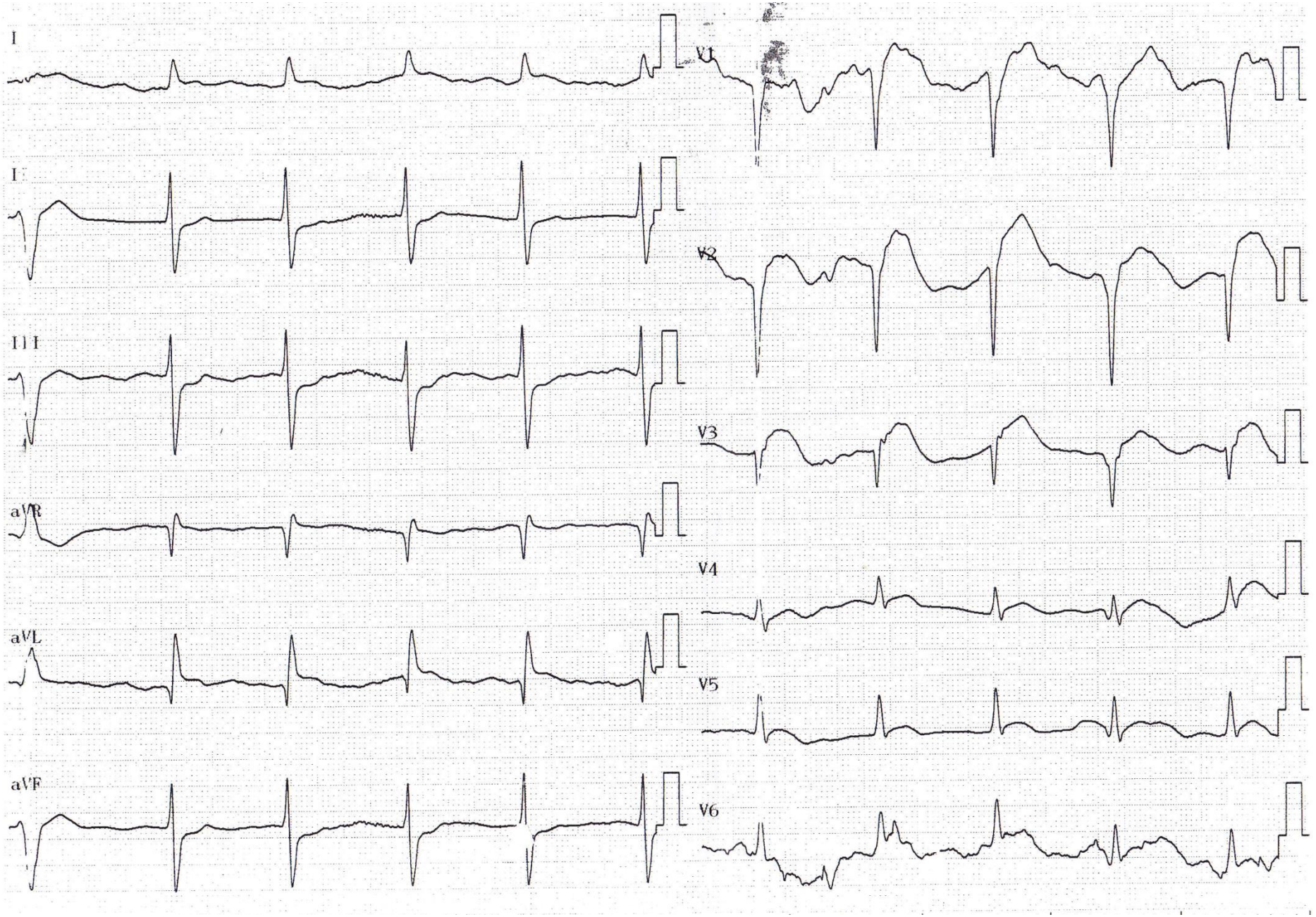

1 mV
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Mason-Likar
Bandwidth: 0.50-40 Hz
10 mm/mV 25.0 mm/s

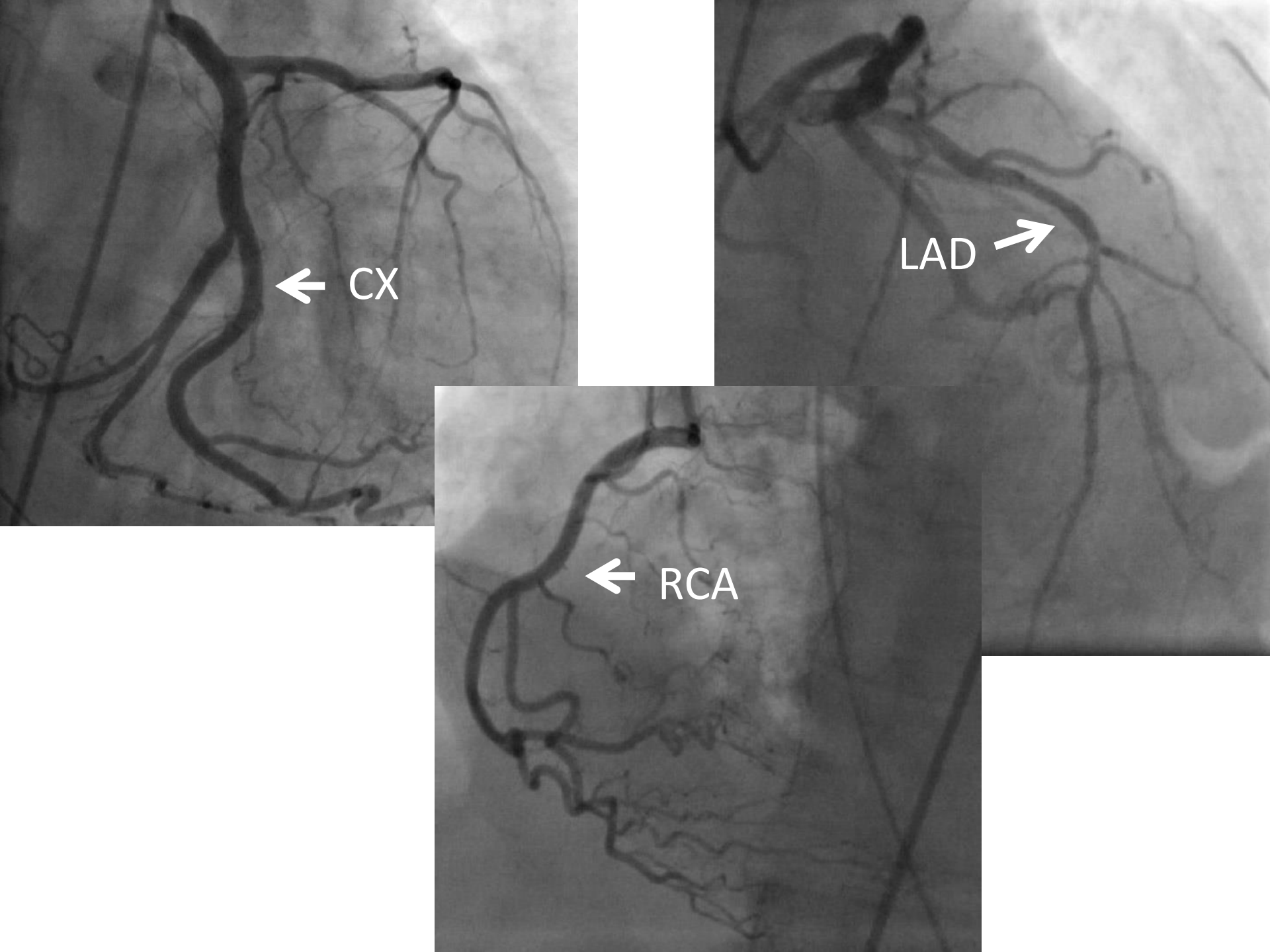
ICN3

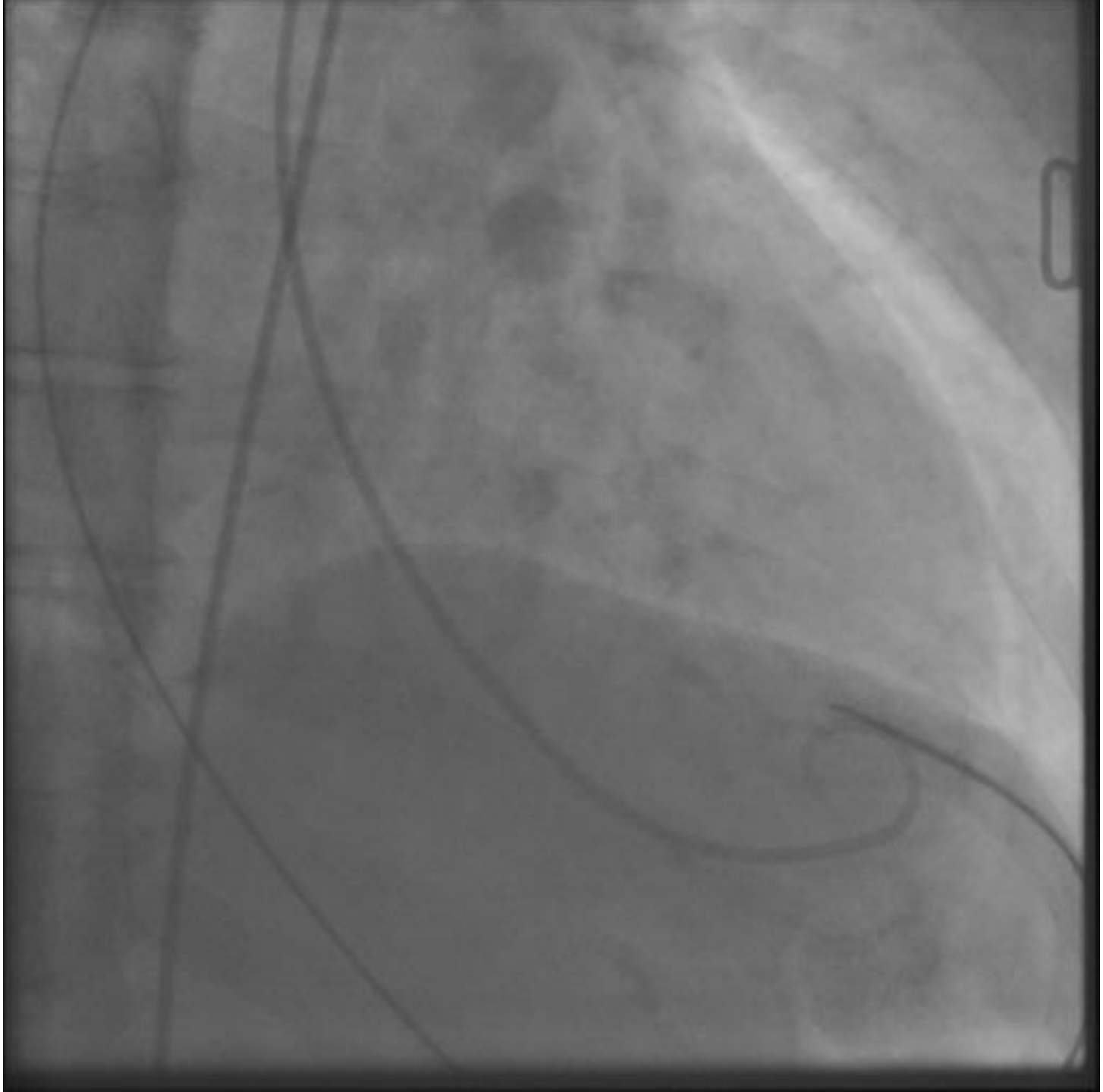




- 46 year old woman
- SLE, treated with aspirin
- Witnessed cardiac arrest in the street
- No bystander CPR
- EMS arrived 15 minutes after arrest
- VF-5 DC shocks
- Arrival at ER:
  - Coma
  - Ventilated
  - NSR
  - BP 90/60 mmHg


I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6


CX
LAD
RCA



Summary

- PPCI should be performed routinely in OHCA survivors with STEMI
- PPCI should be considered in OHCA survivors without STEMI
- PPCI should be combined with therapeutic hypothermia
- Coma does not contraindicate PPCI

Thank you

Multivariate analysis: 5 Year mortality

- PCI: HR: 0.46 [95% CI: 0.34-0.61]; p<0.001
- TH: HR: 0.70 [95% CI: 0.50 to 0.97]; p<0.04