The Culprit Shock Trial Challenges Current Guidelines Does It ?

Jacques Koolen MD PhD
Catharina Hospital Eindhoven
The Netherlands

No conflict of interest

Case presentation

- 48 years old women
- No prevoius complaints
- Physical fitness (mountain biking)
- Witnessed cardiac arrest
- Arrival ambulance 18 min
- VF
- 6x times defibrillation
- Asystolie atropine

- Intubated 60/40-30/0-no output
- Unstable,recurrent VF
- Noradrenaline/dobutamine /amiodarone

- Diagnosis :
- Out of hospital arrest with cardiogenic shock .

Table 11 Primary PCI: indications and procedural aspects

Recommendations	Class[a]	Level[b]	Ref[c]
Indications for primary PCI			
Primary PCI is the recommended reperfusion therapy over fibrinolysis if performed by an experienced team within 120 min of FMC.	I	A	69, 99
Primary PCI is indicated for patients with severe acute heart failure or cardiogenic shock, unless the expected PCI related delay is excessive and the patient presents early after symptom onset.	I	B	100
Procedural aspects of primary PCI			
Stenting is recommended (over balloon angioplasty alone) for primary PCI.	I	A	101, 102
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	75, 103–105
If performed by an experienced radial operator, radial access should be preferred over femoral access.	IIa	B	78, 79
If the patient has no contraindications to prolonged DAPT (indication for oral anticoagulation, or estimated high long-term bleeding risk) and is likely to be compliant, DES should be preferred over BMS.	IIa	A	80, 82, 106, 107
Routine thrombus aspiration should be considered.	IIa	B	83–85
Routine use of distal protection devices is not recommended.	III	C	86, 108
Routine use of IABP (in patients without shock) is not recommended.	III	A	97, 98

BMS = bare-metal stent; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; IABP = intra-aortic balloon pump; PCI = percutaneous coronary intervention.
[a]Class of recommendation.
[b]Level of evidence.
[c]References.

Table 1. Applying Classification of Recommendations and Level of Evidence†

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT ↓ / SIZE OF TREATMENT EFFECT →	CLASS I *Benefit >>> Risk* Procedure/Treatment **SHOULD** be performed/ administered	CLASS IIa *Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	CLASS IIb *Benefit ≥ Risk* *Additional studies with broad objectives needed; additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	CLASS III *Risk ≥ Benefit* *No additional studies needed* Procedure/Treatment should **NOT** be performed/administered **SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL**
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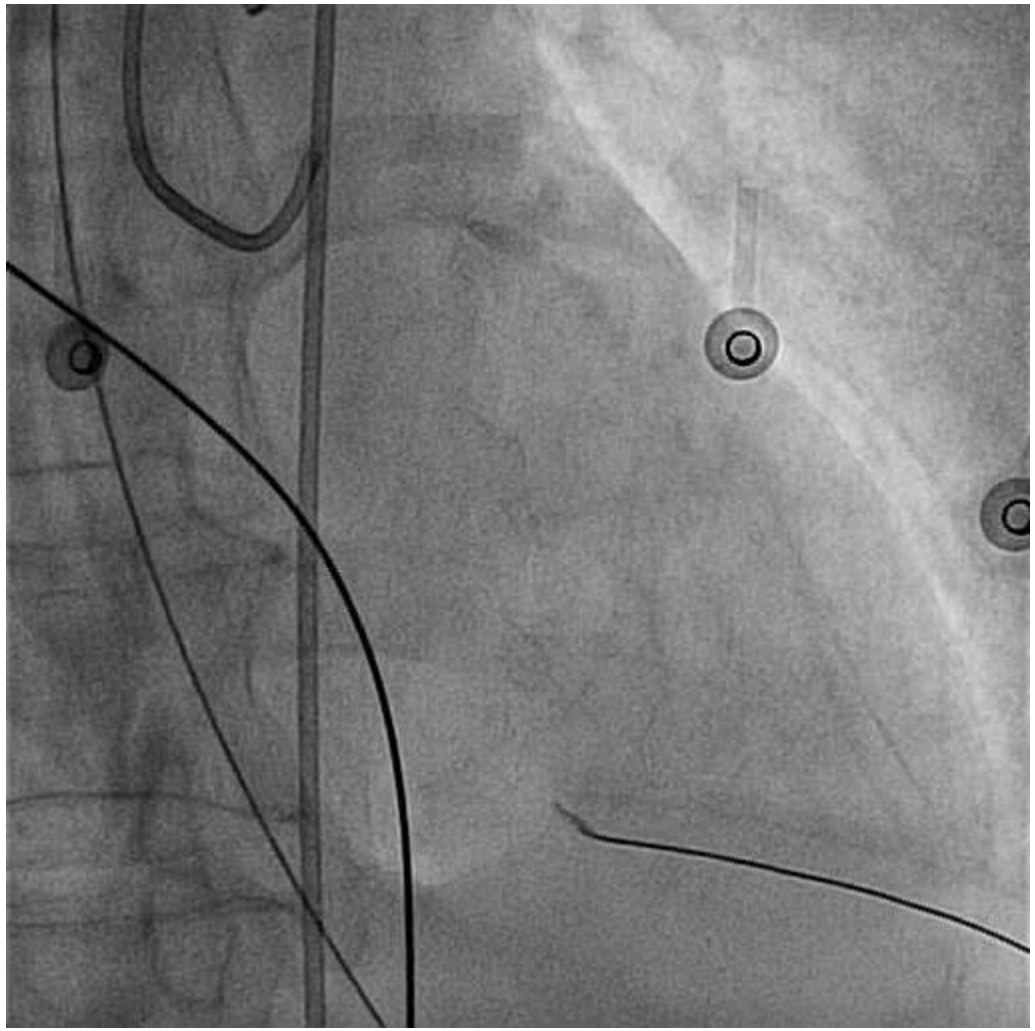

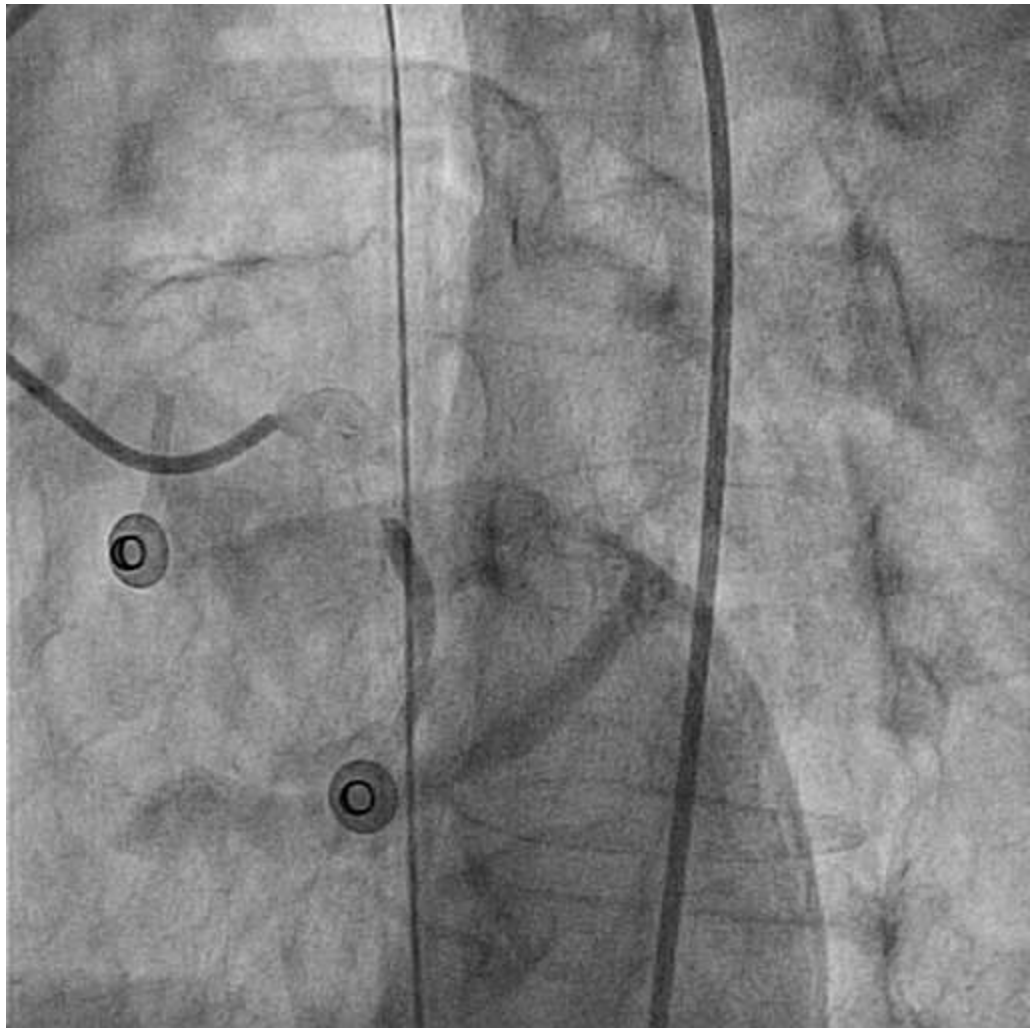

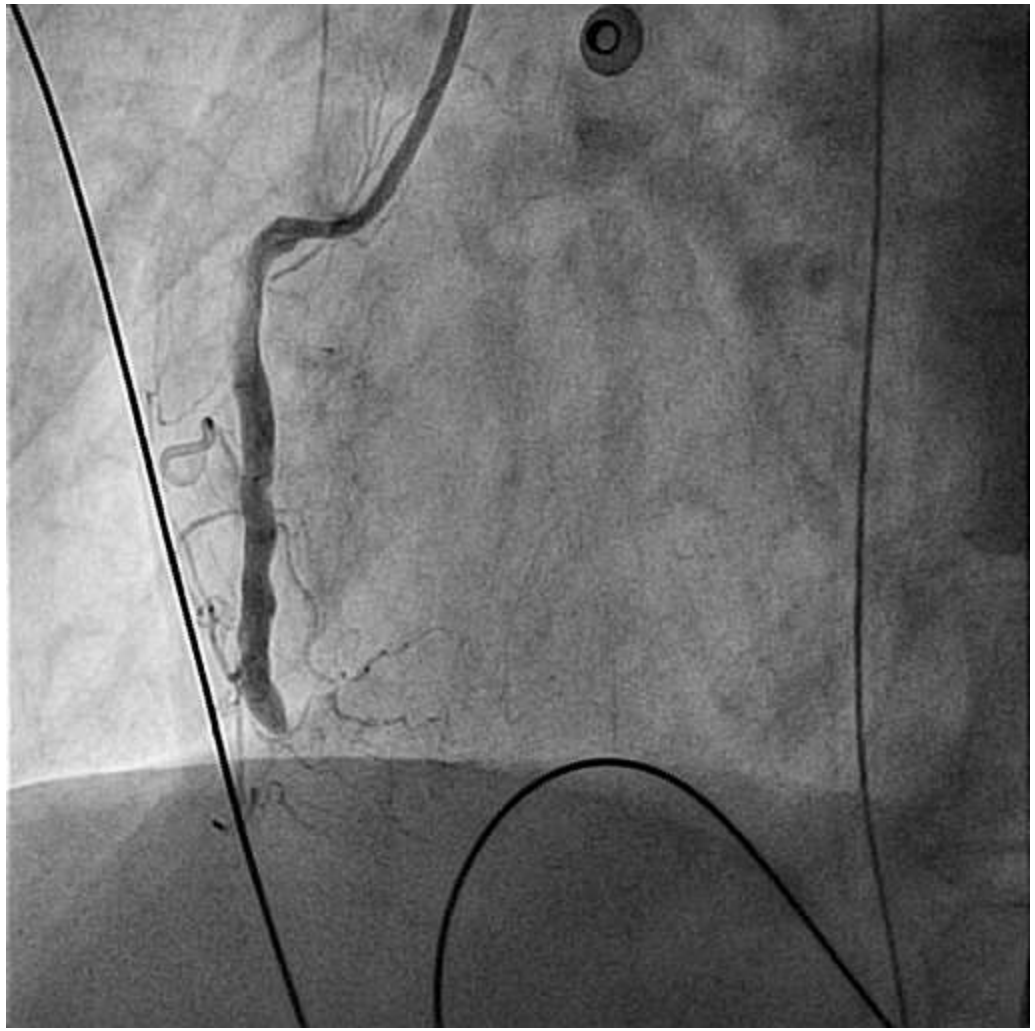

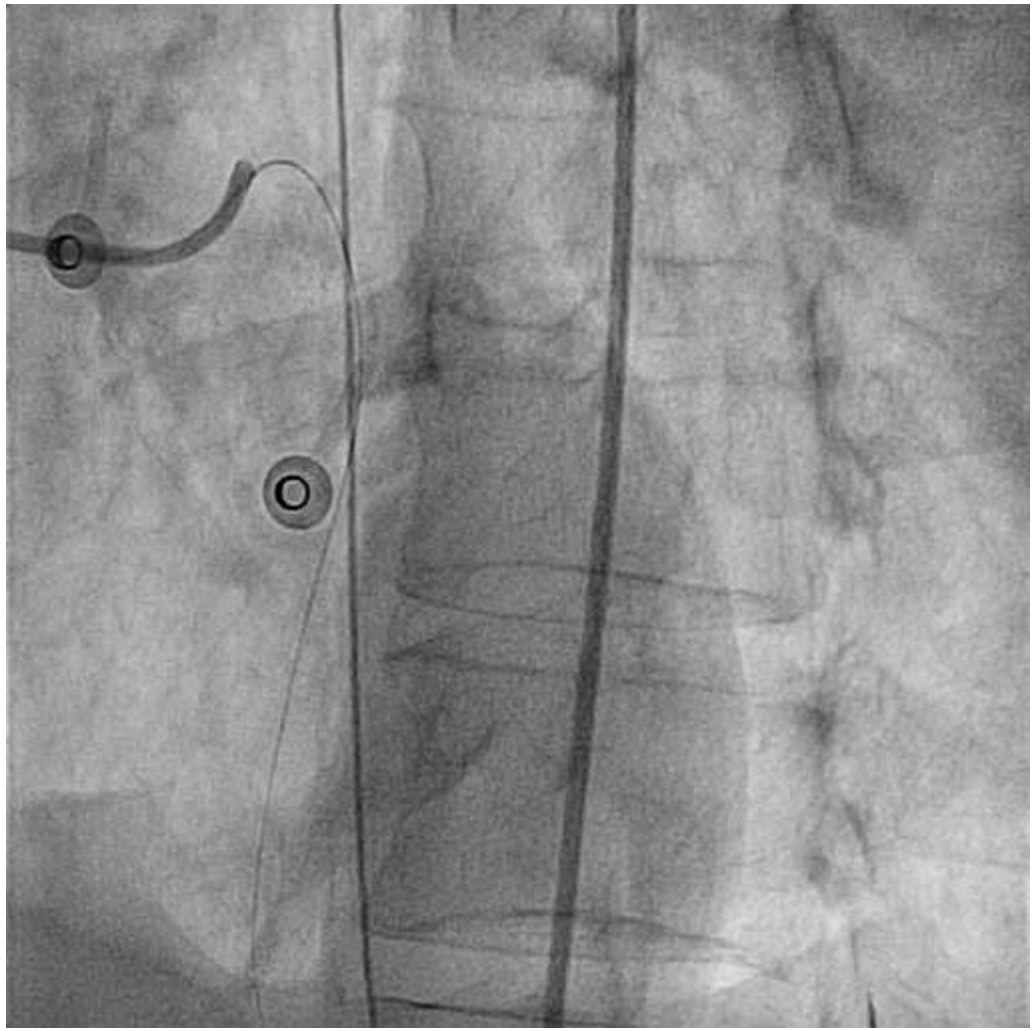

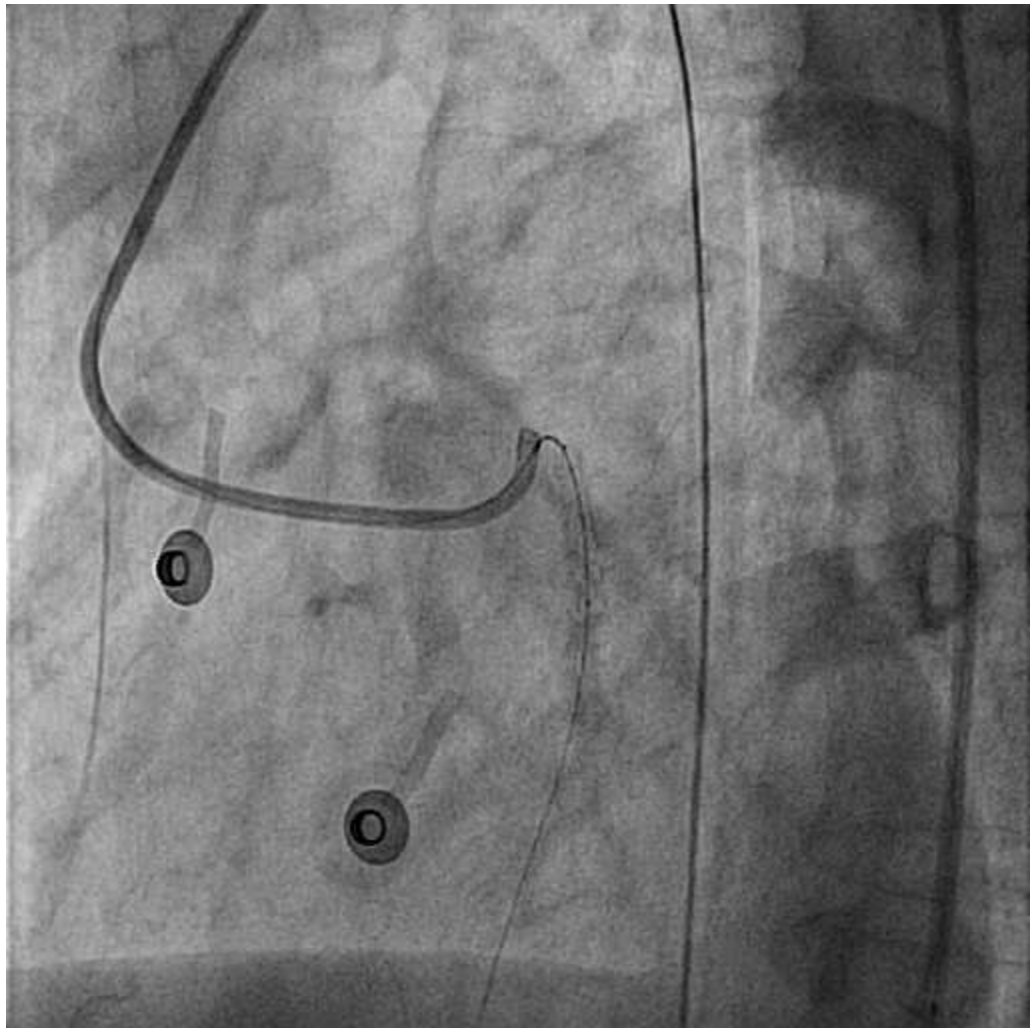

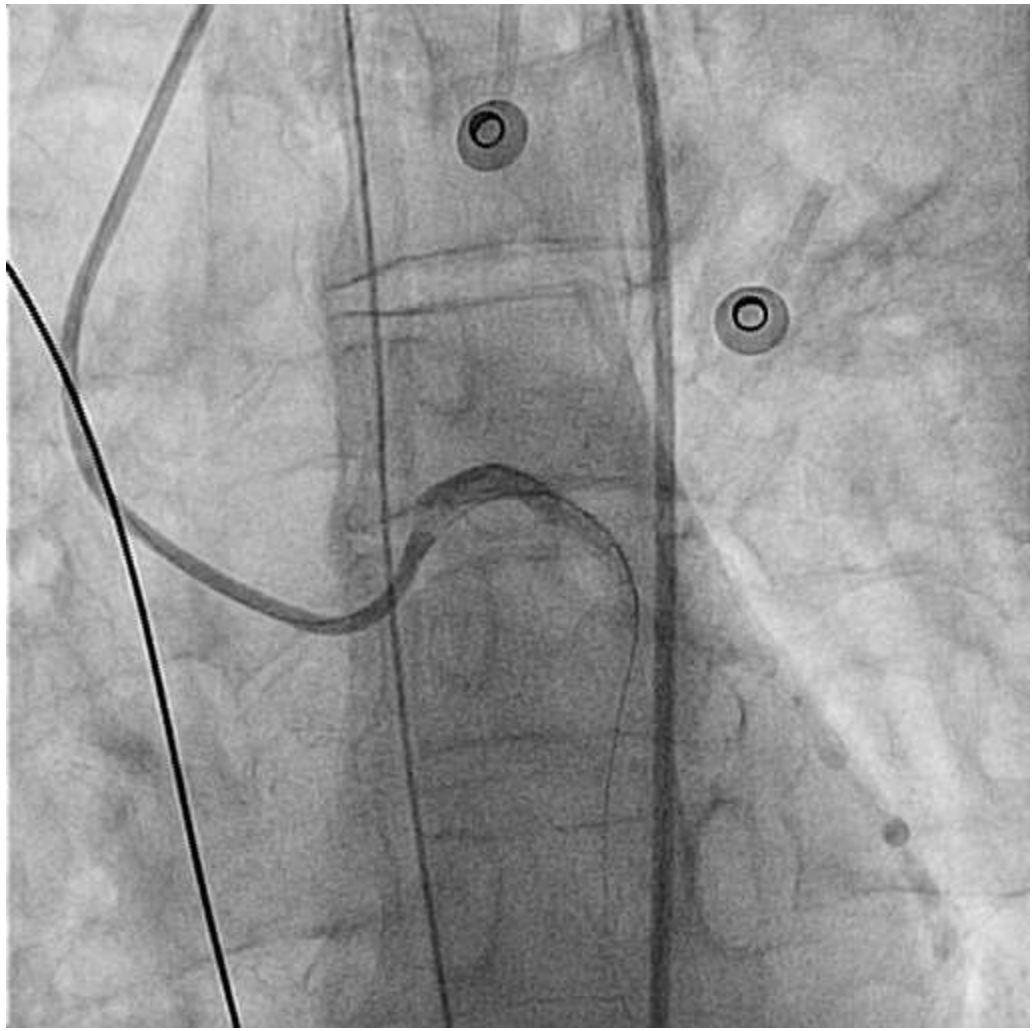

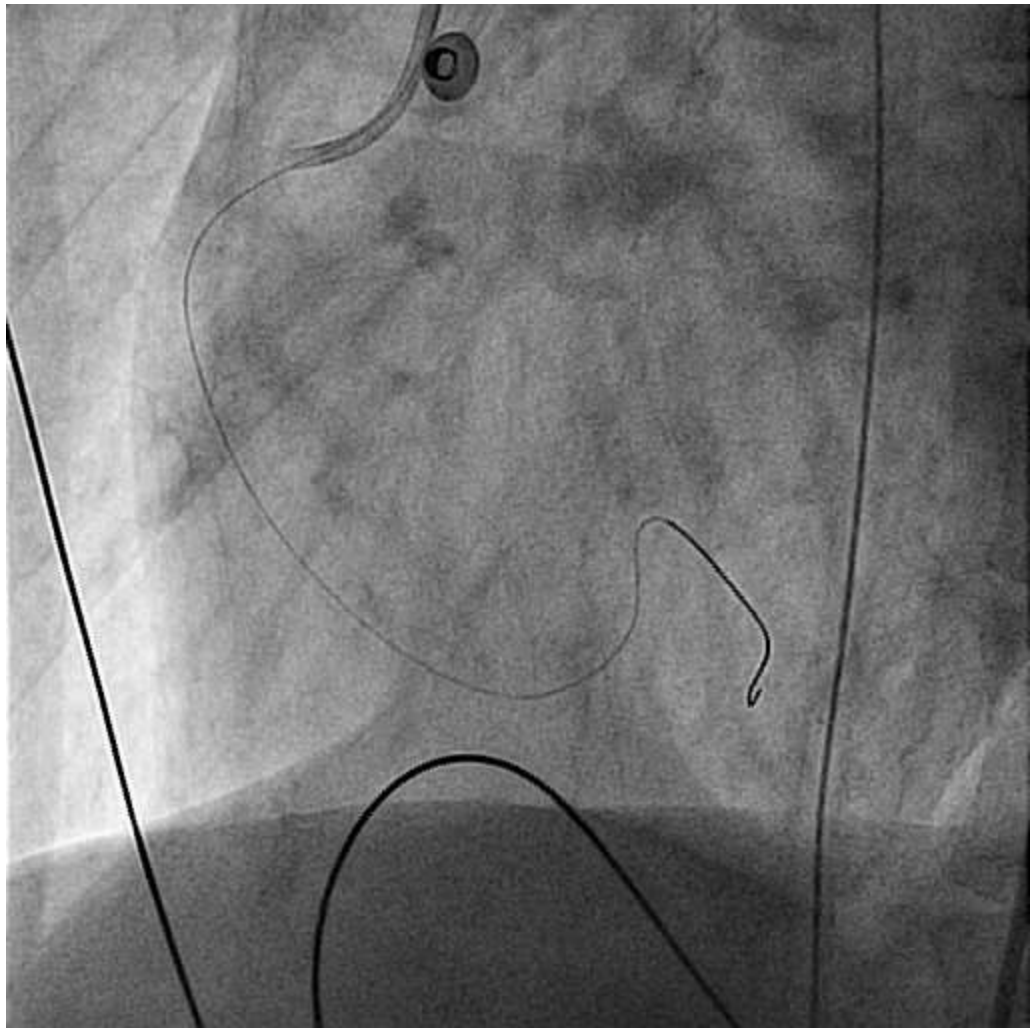

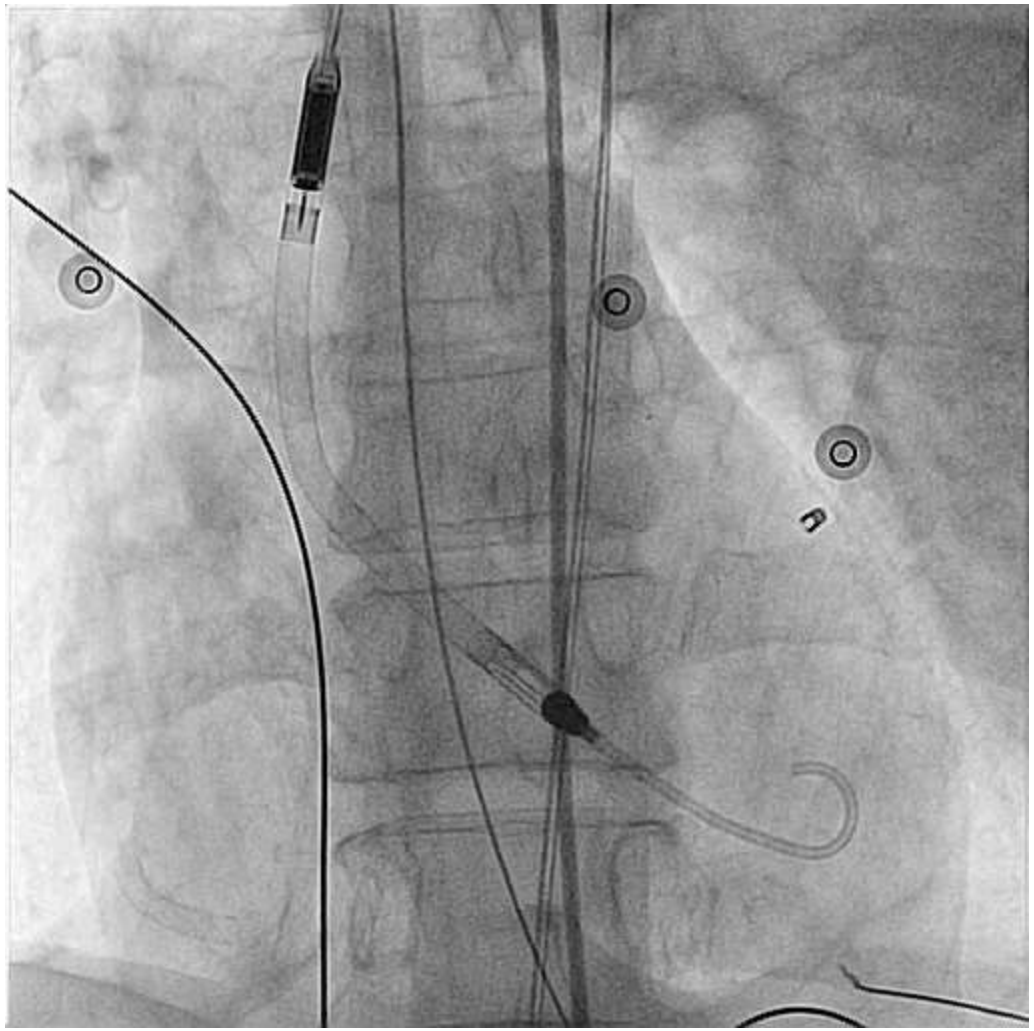

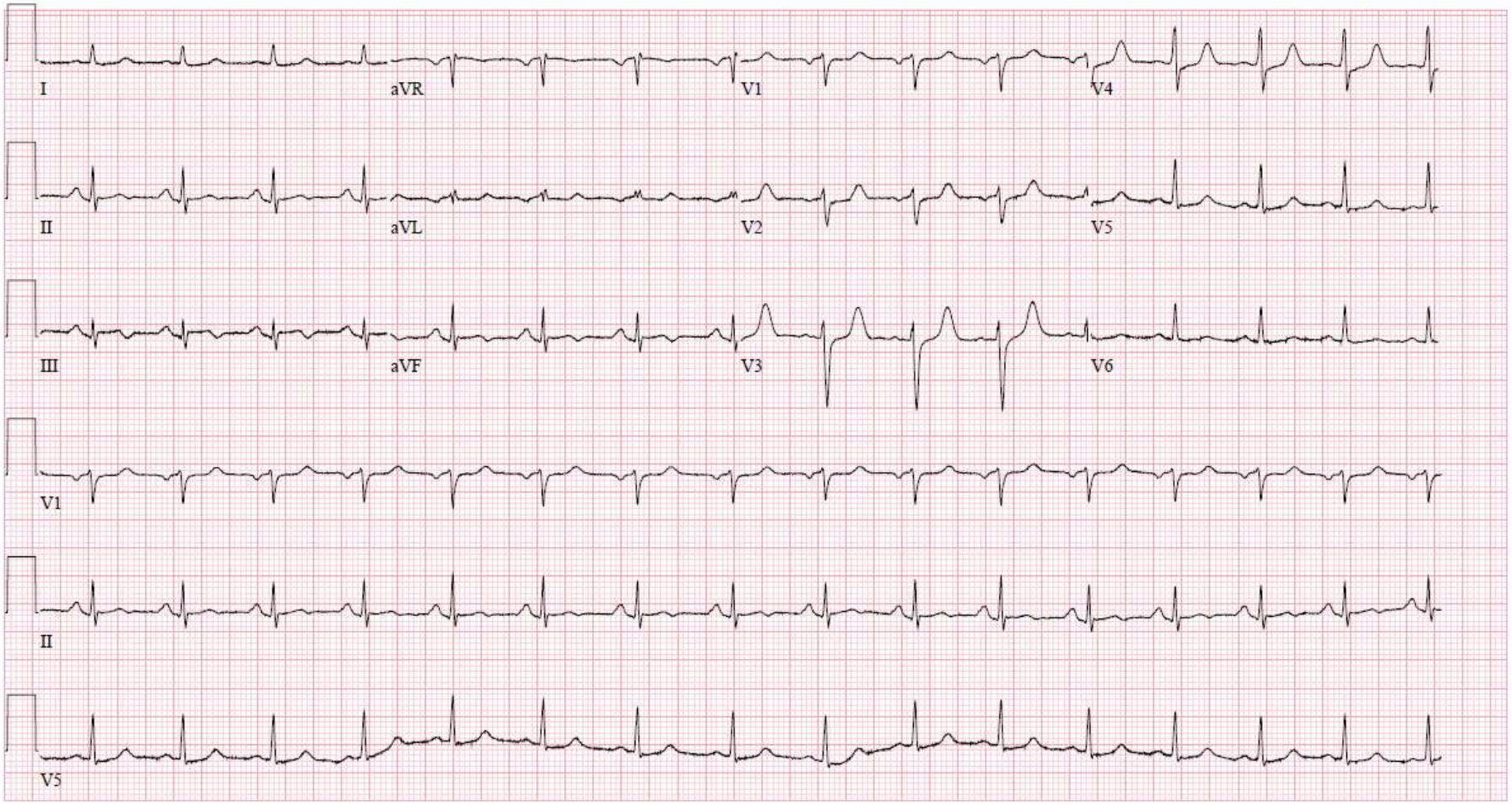
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CULPRIT-SHOCK

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock

H. Thiele, I. Akin, M. Sandri, G. Fuernau, S. de Waha, R. Meyer-Saraei, P. Nordbeck, T. Geisler, U. Landmesser, C. Skurk, A. Fach, H. Lapp, J.J. Piek, M. Noc, T. Goslar, S.B. Felix, L.S. Maier, J. Stepinska, K. Oldroyd, P. Serpytis, G. Montalescot, O. Barthelemy, K. Huber, S. Windecker, S. Savonitto, P. Torremante, C. Vrints, S. Schneider, S. Desch, and U. Zeymer, for the CULPRIT-SHOCK Investigators*

At 30 days ,the composite primary endpoint of death or renal-replacement therapy :
occcured in 158/344 (45,0 %) in Culprit Lesion Only
Versus 189/341 (55,4%) in multivessel PCI group

Culprit Shock: No Difference in Cardiac Causes of Death

Cause	Culprit only	Multivessel
Sudden death	11 (7.4%)	12 (6.8%)
Recurrent MI	2 (1.3%)	2 (1.1%)
Refractory Shock	104 (69.8%)	108 (61.4%)

Multivessel PCI did not worsen cardiac outcomes

. Multivessel PCI in STEMI Patients With Cardiogenic Shock

KAMIR-NIH registry: 659 pts who underwent multivessel PCI (39.5%) or infarct-related artery (IRA)-only PCI (60.5%), Nov 2011-Dec 2015.

1-Year Outcomes	Multivessel PCI	IRA-Only PCI	Adjusted HR (95% CI)
All-Cause Death	21.3%	31.7%	0.52 (0.38-0.73)
Non-IRA Repeat Revascularization	6.7%	8.2%	0.33 (0.14-0.78)

No differences in new requirement for renal replacement therapy by 30 days between the two groups, with an overall rate of 3.3%.

Conclusion: Patients with STEMI and cardiogenic shock who undergo multivessel PCI stand to derive improved 1-year outcomes.

Lee JM, et al. *J Am Coll Cardiol*. 2018;71:844-856.

One prospective randomized trial = Level B evidence

Impact II A ?

No change in level remains II A – B

180 degree turn ?

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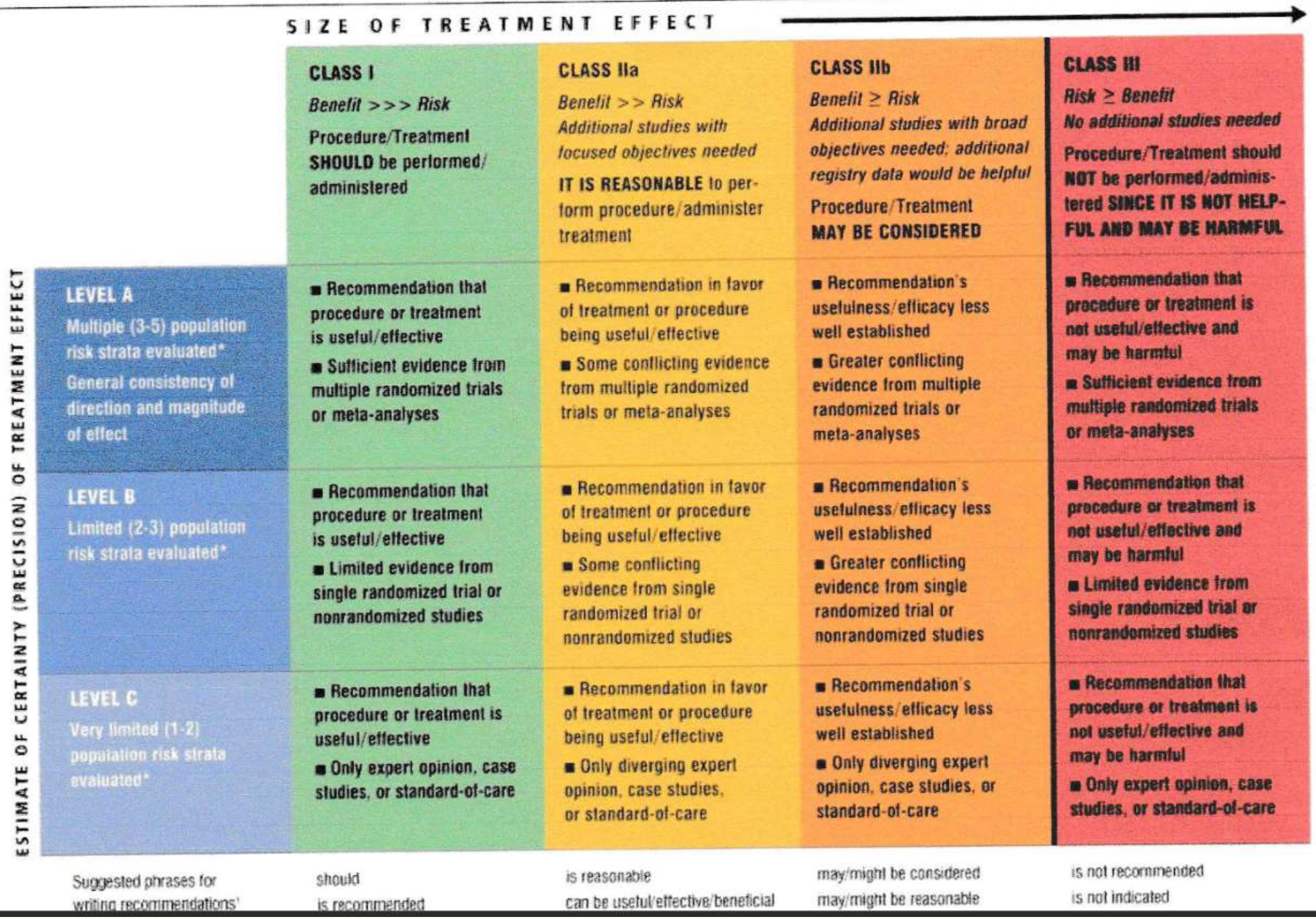

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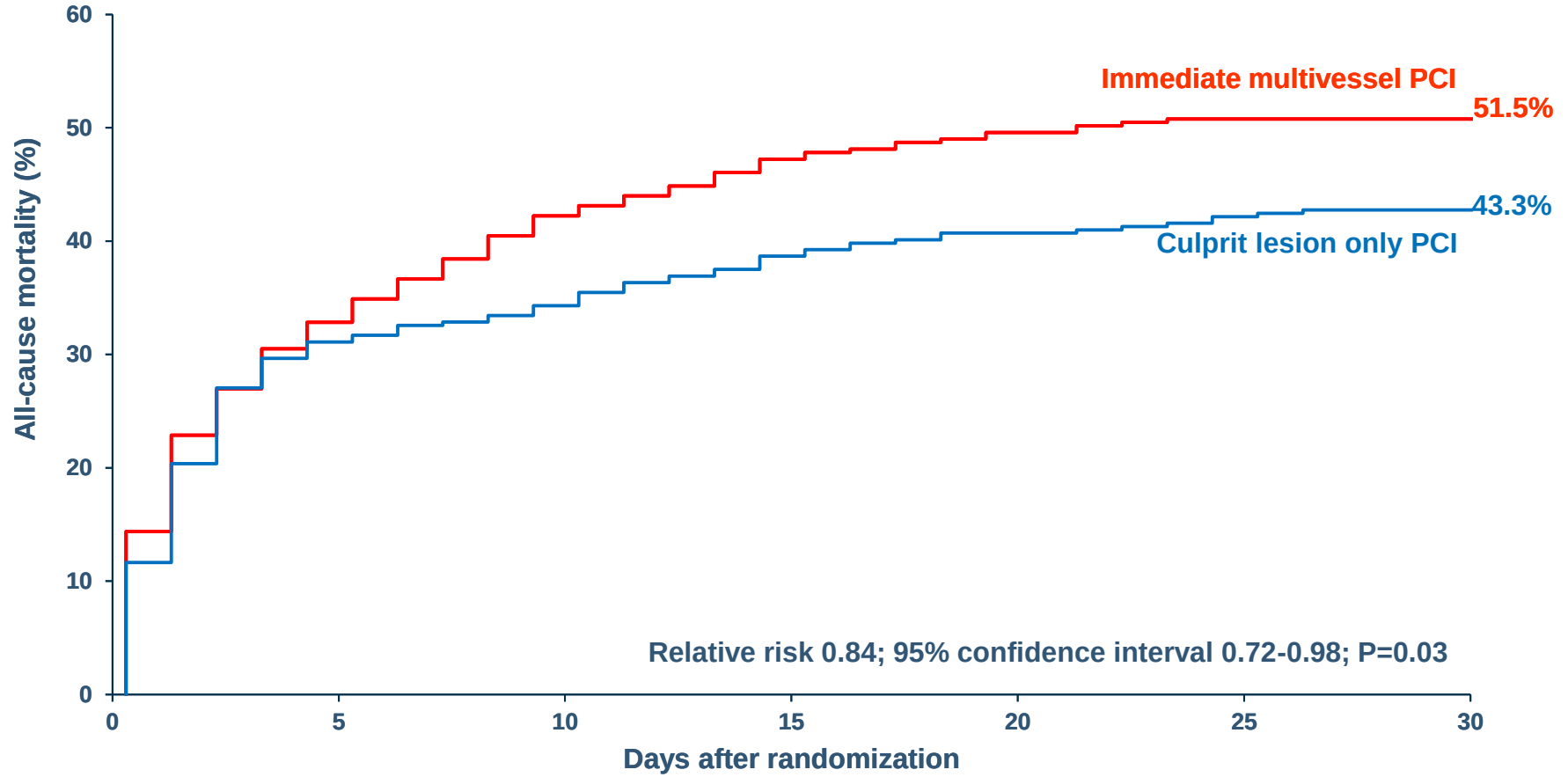
- The evidence is still at the same level
- The argument has turned 180 degrees
- So ……

No Evidence of "Initial" Harm with Multivessel PCI



Number at risk:

Culprit lesion only PCI	344	237	226	211	203	198	193
Immediate multivessel PCI	341	229	197	179	170	166	165

One prospective randomized trial =Level Evidence II B

Recommendation II A ??

No change in level of evidence just 180 degreee turn ?!

Culprit Shock Questions

- Severity of illness?
  - Pressors >90%, Mechanical Ventilation in 82%, Resuscitation in 53% suggest patients are very sick
  - Lactate normal in 30%, median systolic BP of 100 and HR of 90 suggest that not all were in shock
- No data on invasive hemodynamics, type and dose of vasopressors or inotropic drugs
- Limited use of hemodynamic support
  - When used was it placed pre- PCI?
  - Would multivessel PCI results have been better if support used?
- Should multivessel PCI have been staged?

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CULPRIT-SHOCK

CULPRIT-SHOCK: A Randomized Trial of Multivessel PCI in Cardiogenic Shock

Holger Thiele, MD and Georg Fuernau, MD

on behalf of the CULPRIT-SHOCK Investigators

My Conclusions from Culprit Shock

- Amazing trial that will change the management of cardiogenic shock
- Mortality differences may have been due, in part, to anoxic brain injury present at the time of presentation
- Routine multivessel PCI did not reduce inotropic requirement, ICU time or any measure of CHF
- Potential harm: increased time in the lab, risk of renal failure and possibly mortality
- Many unanswered questions for future trials

Current situation with Guidelines

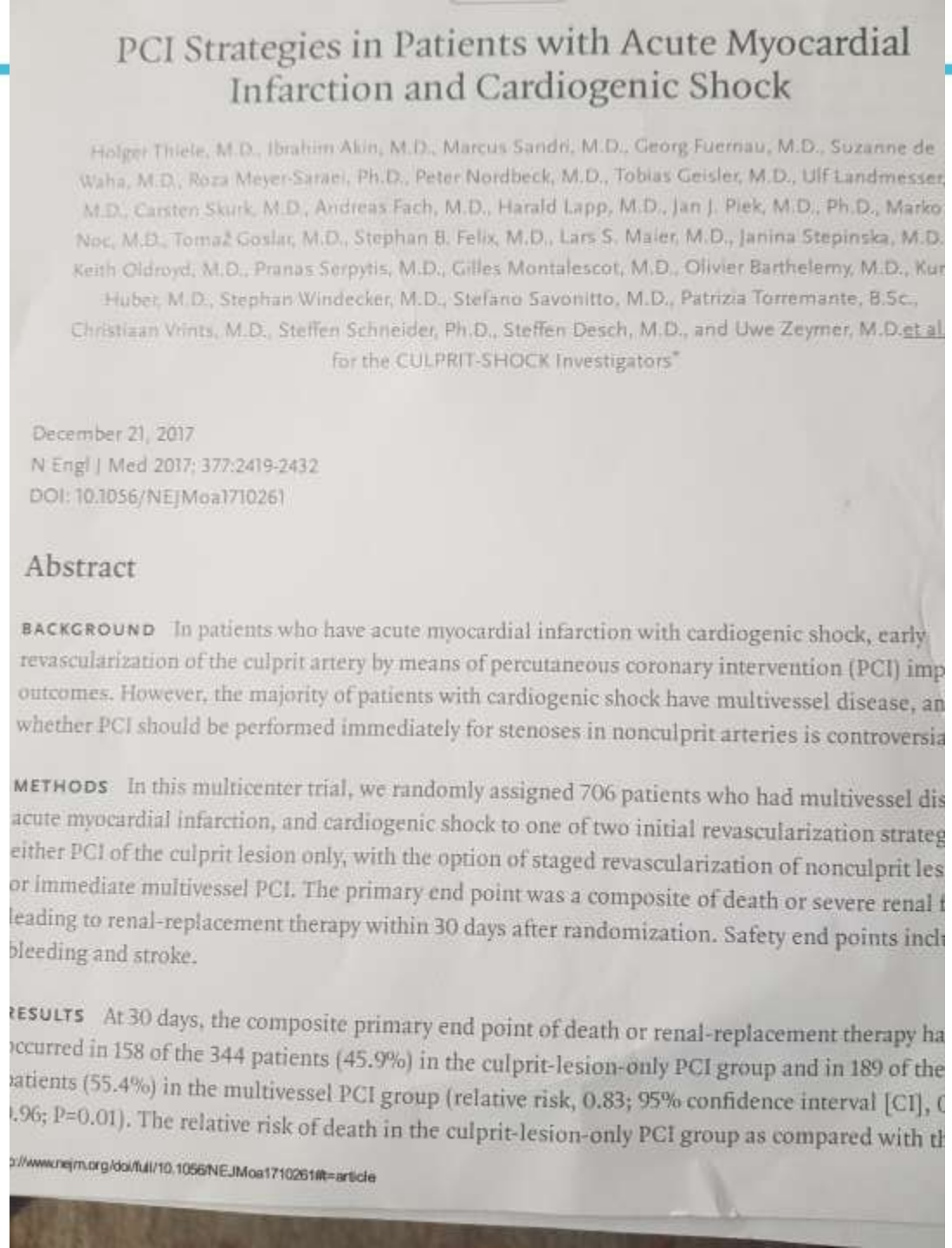
- Developed and published by International Organisations
  - Typically ESC, ACC
- Usually prepared by volunteer writing groups
- Cover a “whole topic”
- Very long…

So do we need to change?

- It has been suggested that guidelines could instead be written by:
  - "experts in health research methodology"
- Could be presented in a "modular digital" format
- And could abandon the confusing IIa, B nomenclature in favour of the GRADE system
- It has even been suggested that:
  - "Guideline content should be integrated into the Electronic Medical Record"

Class II reccomendation =

Level of evidence =



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December 21, 2017
N Engl J Med 2017; 377:2419-2432
DOI: 10.1056/NEJMoa1710261

Abstract

BACKGROUND In patients who have acute myocardial infarction with cardiogenic shock, early revascularization of the culprit artery by means of percutaneous coronary intervention (PCI) imp outcomes. However, the majority of patients with cardiogenic shock have multivessel disease, an whether PCI should be performed immediately for stenoses in nonculprit arteries is controversia

METHODS In this multicenter trial, we randomly assigned 706 patients who had multivessel dis acute myocardial infarction, and cardiogenic shock to one of two initial revascularization strateg either PCI of the culprit lesion only, with the option of staged revascularization of nonculprit les or immediate multivessel PCI. The primary end point was a composite of death or severe renal f leading to renal-replacement therapy within 30 days after randomization. Safety end points incl bleeding and stroke.

RESULTS At 30 days, the composite primary end point of death or renal-replacement therapy ha occurred in 158 of the 344 patients (45.9%) in the culprit-lesion-only PCI group and in 189 of the atients (55.4%) in the multivessel PCI group (relative risk, 0.83; 95% confidence interval [CI], 0 .96; P=0.01). The relative risk of death in the culprit-lesion-only PCI group as compared with th

Questions / decision moments

- Treat culprit only ?
- Treat all lesions ?
- Insert assist device first or PCI first (as fast as possible opening up the vessels)
- Which assist device ?
- Cool or no to Cool

multivessel PCI group was 0.84 (95% CI, 0.72 to 0.98; P=0.03), and the relative risk of renal-replacement therapy was 0.71 (95% CI, 0.49 to 1.03; P=0.07). The time to hemodynamic stabilization, the risk of catecholamine therapy and the duration of such therapy, the levels of troponin T and creatine kinase, and the rates of bleeding and stroke did not differ significantly between the two groups.

CONCLUSIONS Among patients who had multivessel coronary artery disease and acute myocardial infarction with cardiogenic shock, the 30-day risk of a composite of death or severe renal failure leading to renal-replacement therapy was lower among those who initially underwent PCI of the culprit lesion only than among those who underwent immediate multivessel PCI. (Funded by the European Union 7th Framework Program and others; CULPRIT-SHOCK ClinicalTrials.gov number, NCT01927549.)

Funding and Disclosures

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Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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Culprit Shock Appreciation

- Largest randomized shock trial ever conducted!
- Ability to collaborate and coordinate care of sick patients among numerous international sites
- Broad inclusion criteria, representative of typical shock patients that are taken to the cath lab
- Ability to randomize without consent in many cases (enhances enrollment, true all comers population with few exceptions)
- Reasonable protocol adherence
- Mortality difference

Table 7 Cardiac arrest

Recommendations	Class[a]	Level[b]	Ref[c]
All medical and paramedical personnel caring for a patient with suspected myocardial infarction must have access to defibrillation equipment and be trained in cardiac life support.	I	C	-
It is recommended to initiate ECG monitoring at the point of FMC in all patients with suspected myocardial infarction.	I	C	-
Therapeutic hypothermia is indicated early after resuscitation of cardiac arrest patients who are comatose or in deep sedation.	I	B	34–36
Immediate angiography with a view to primary PCI is recommended in patients with resuscitated cardiac arrest whose ECG shows STEMI.	I	B	31–33
Immediate angiography with a view to primary PCI should be considered in survivors of cardiac arrest without diagnostic ECG ST-segment elevation but with a high suspicion of ongoing infarction.	IIa	B	31, 33

ECG = electrocardiogram; FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.
[a]Class of recommendation.
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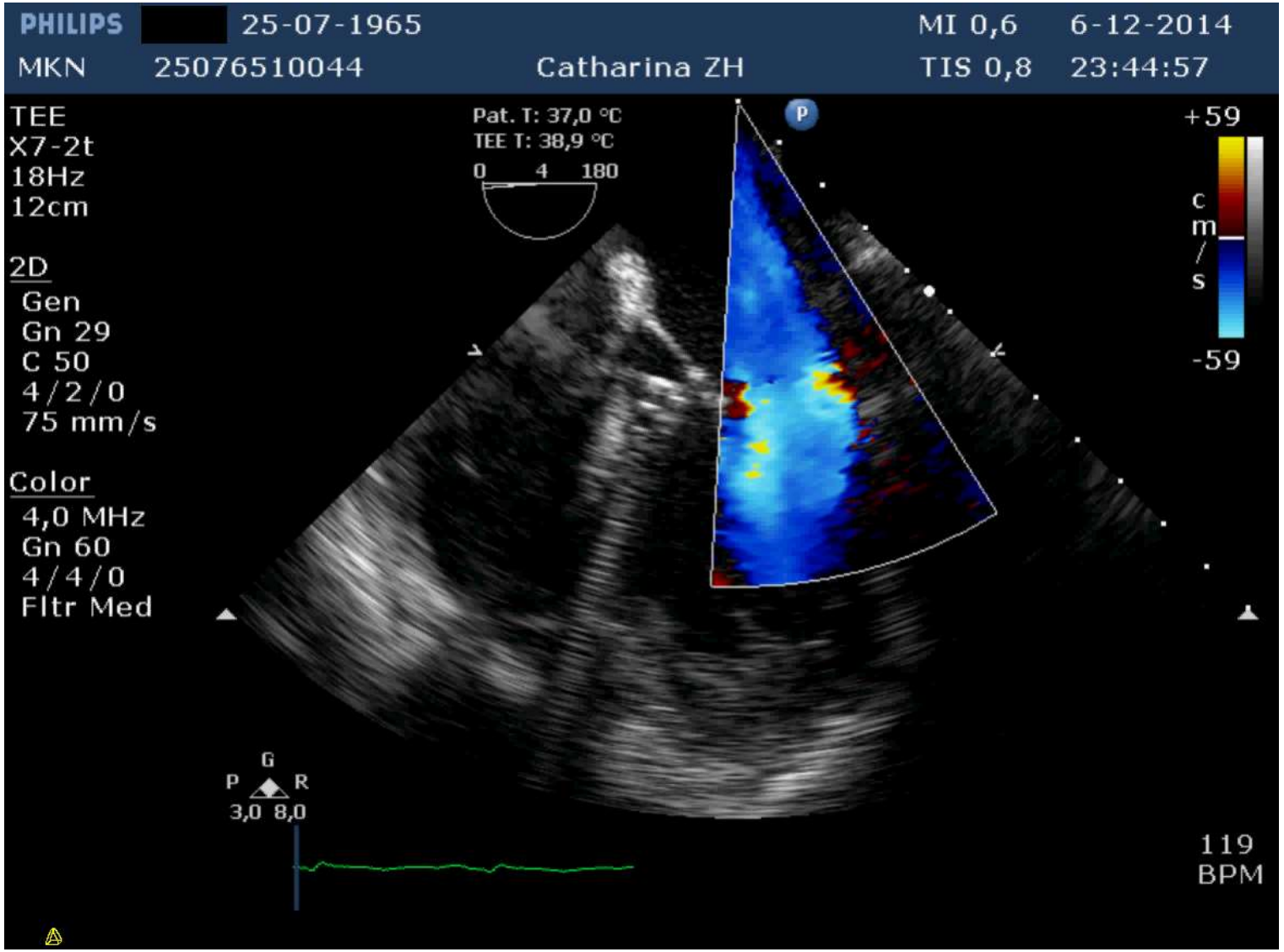
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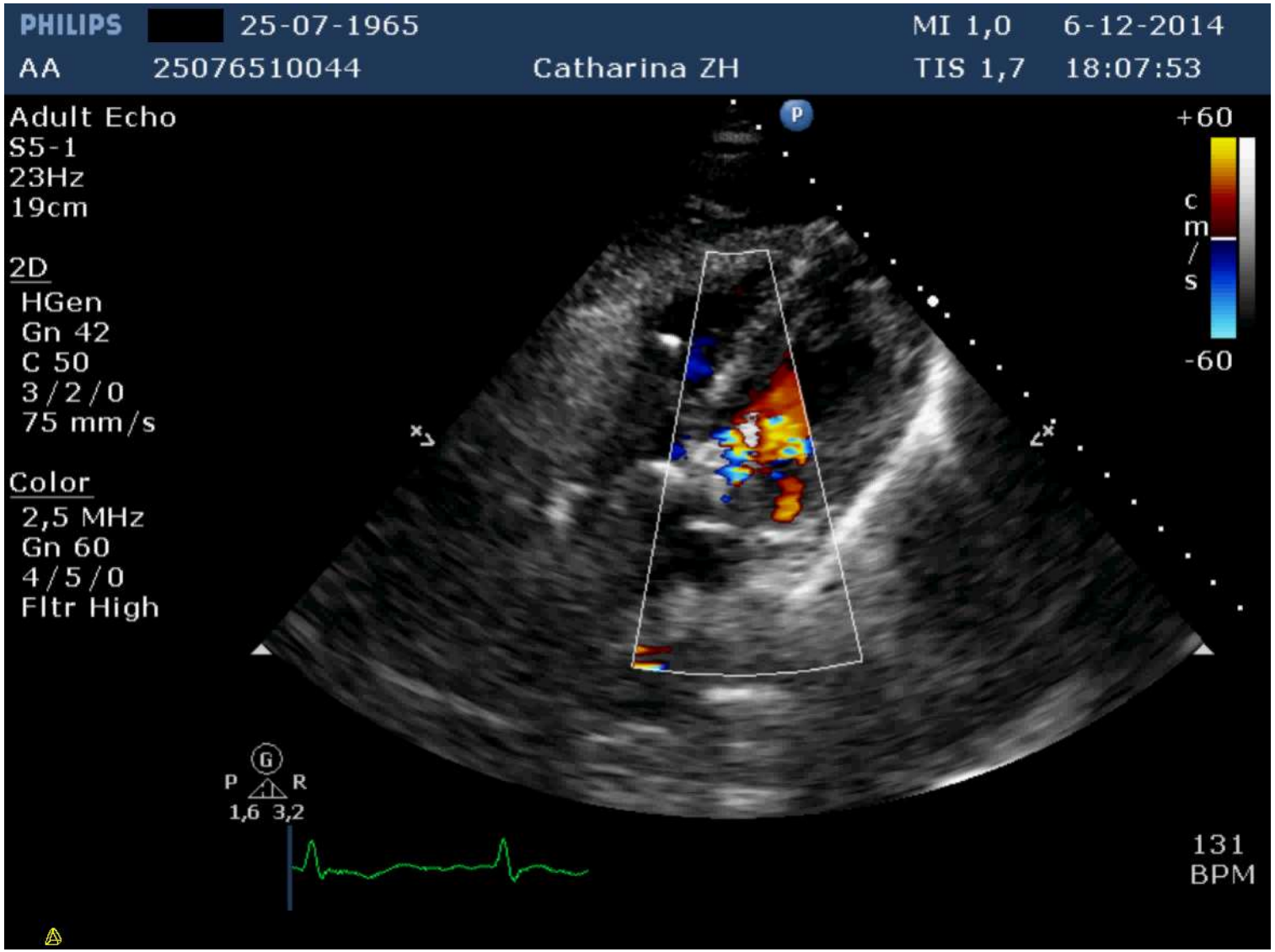
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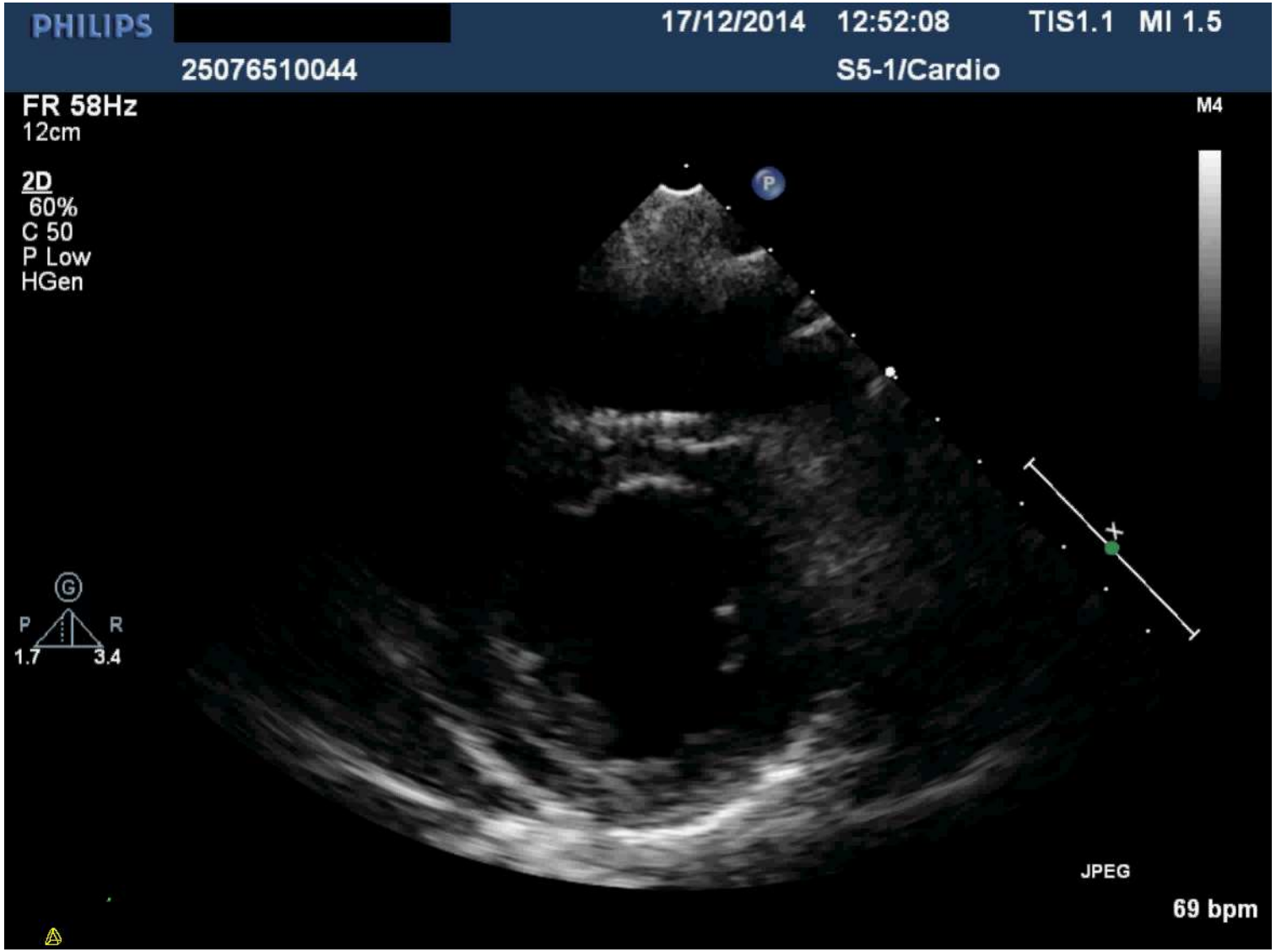
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