
20th CARDIOVASCULAR SUMMIT
TCTAP 2015

APRIL 28-MAY 1, 2015
COEX, SEOUL, KOREA



Case presentation

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



Situation Netherlands

- Direct call ambulance 112
- < 15 minutes arrival time (mandatory)
- Direct transfer to interventional Hospital
- Paramedics decision
- ECG transfer possible in case of doubt.

-
- Intubated 60/40-30/0-no output
 - Unstable, recurrent VF
 - Noradrenaline/dobutamine /amiodarone
 - Diagnosis :
 - Out of hospital arrest with cardiogenic shock .

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



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.

^aClass of recommendation.

^bLevel of evidence.

^cReferences.



Table 11 Primary PCI: indications and procedural aspects

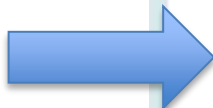
Recommendations	Class ^a	Level ^b	Ref ^c
Indications for primary PCI			
Primary PCI is the recommended reperfusion therapy over fibrinolysis if performed by an experienced team within 120 min of FMC.	I	A	69, 99
Primary PCI is indicated for patients with severe acute heart failure or cardiogenic shock, 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

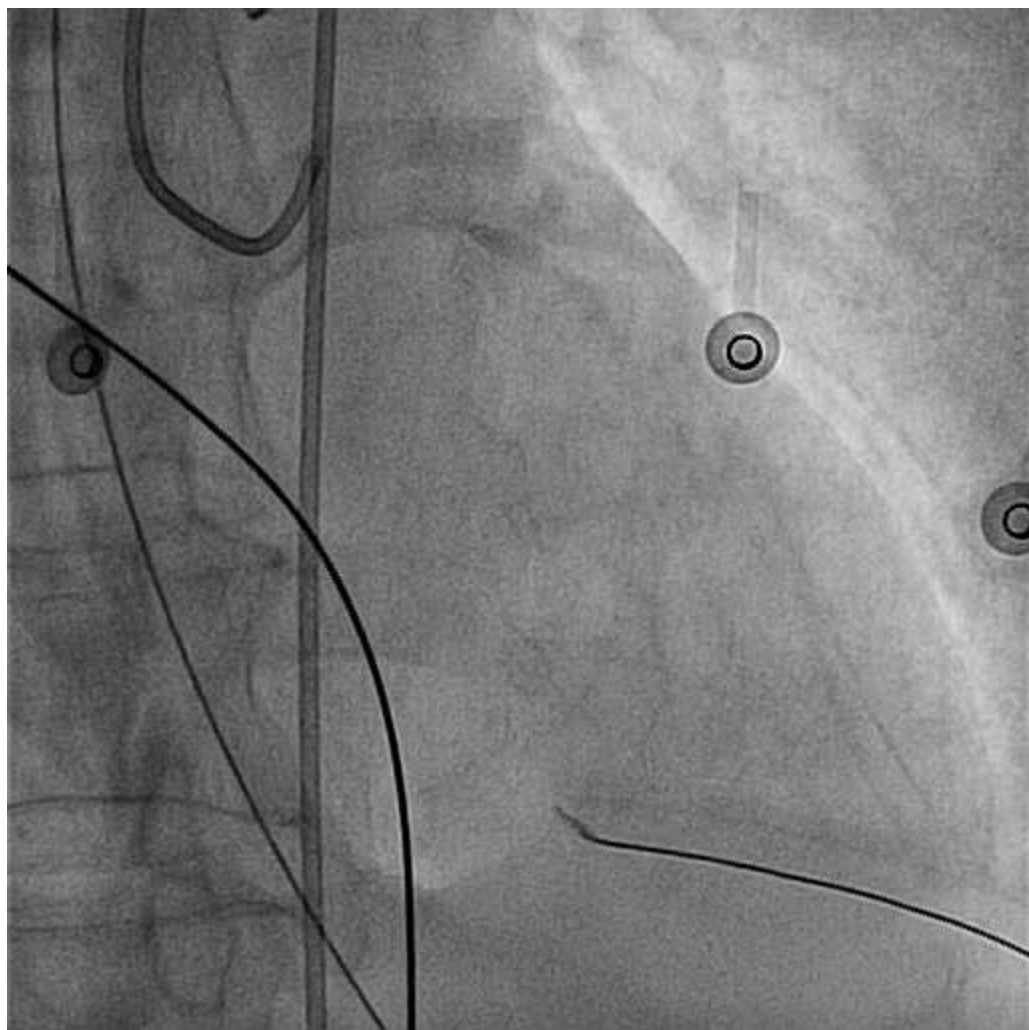
BMS = bare-metal stent; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; IABP = intra-aortic balloon pump; PCI = percutaneous coronary intervention.

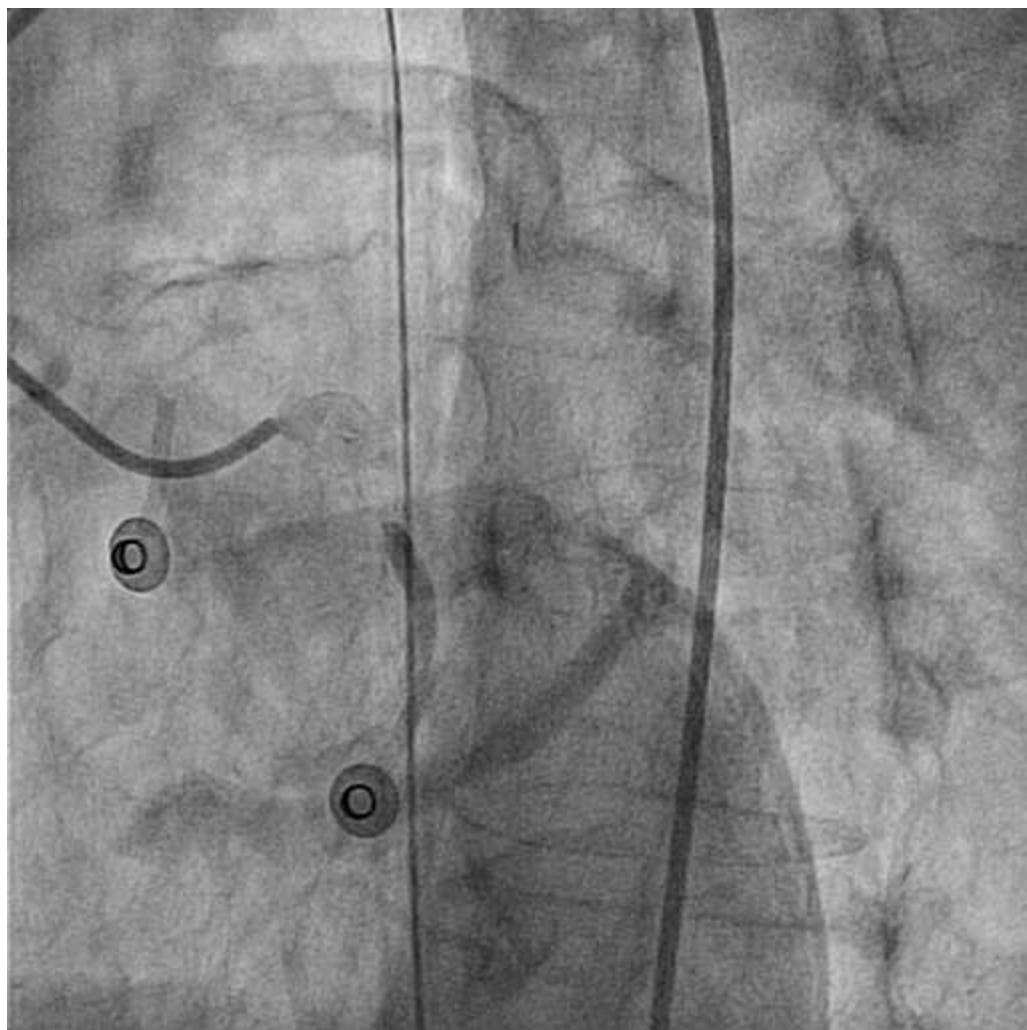
^aClass of recommendation.

^bLevel of evidence.

^cReferences.







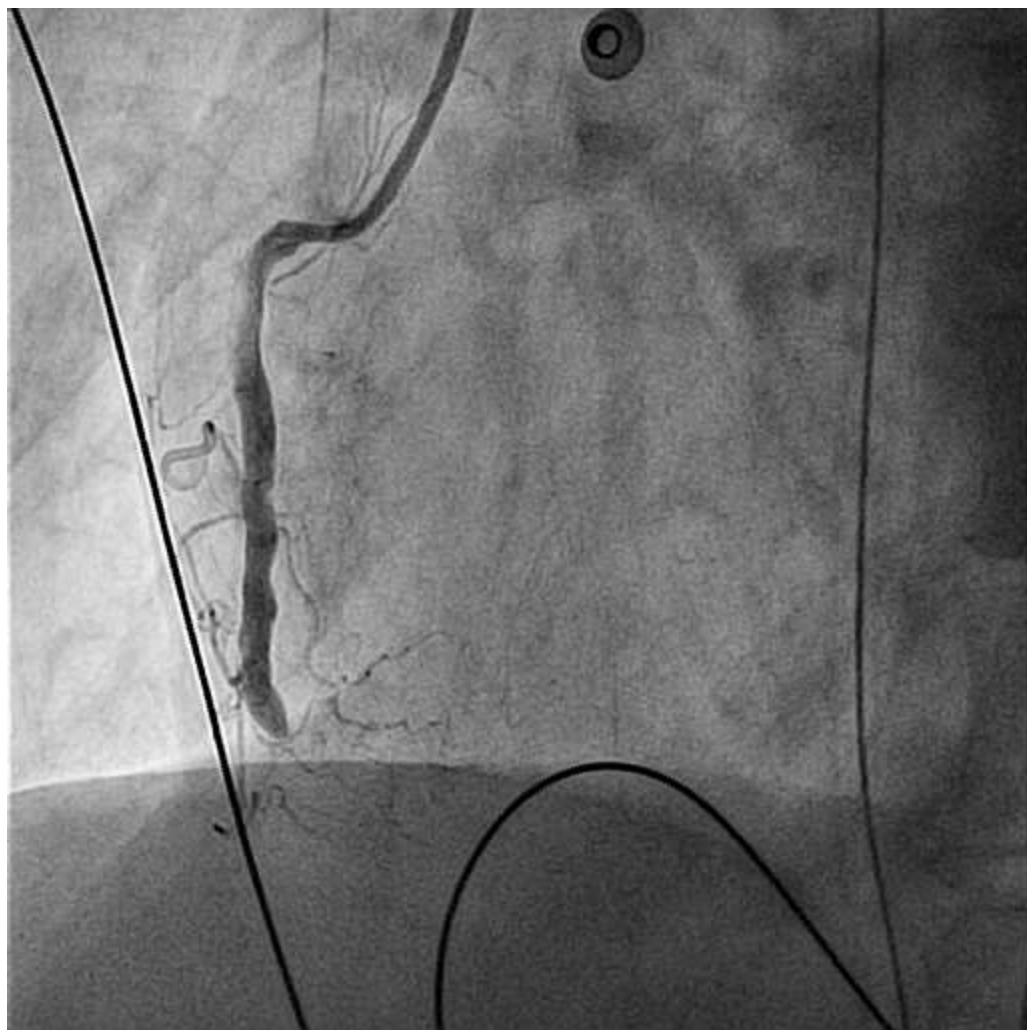


Table 23 Treatment of heart failure and left ventricular dysfunction

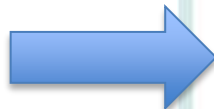
Recommendations	Class ^a	Level ^b	Ref ^c
Treatment of mild heart failure (Killip class II)			
Oxygen is indicated to maintain a saturation >95%.	I	C	-
Loop diuretics, e.g. furosemide 20–40 mg i.v., is recommended and should be repeated at 1–4 h intervals if necessary.	I	C	-
i.v. nitrates or sodium nitroprusside should be considered in patients with elevated systolic blood pressure.	IIa	C	-
An ACE inhibitor is indicated in all patients with signs or symptoms of heart failure and/or evidence of LV dysfunction in the absence of hypotension, hypovolaemia, or renal failure.	I	A	309–312
An ARB (valsartan) is an alternative to ACE inhibitors particularly if ACE inhibitors are not tolerated.	I	B	281
An aldosterone antagonist (eplerenone) is recommended in all patients with signs or symptoms of heart failure and/or evidence of LV dysfunction provided no renal failure or hyperkalaemia.	I	B	282
Hydralazine and isosorbide dinitrate should be considered if the patient is intolerant to both ACE inhibitors and ARBs.	IIa	C	313
Treatment of moderate heart failure (Killip class III)			
Oxygen is indicated.	I	C	-
Ventilatory support should be instituted according to blood gases.	I	C	-
Loop diuretics, e.g. furosemide 20–40 mg i.v., are recommended and should be repeated at 1–4 h intervals if necessary.	I	C	-
Morphine is recommended. Respiration should be monitored. Nausea is common and an antiemetic may be required. Frequent low-dose therapy is advisable.	I	C	-
Nitrates are recommended if there is no hypotension.	I	C	-
Inotropic agents:			
• Dopamine	IIa	C	-
• Dobutamine (inotropic)	IIa	C	-
• Levosimendan (inotropic/vasodilator).	IIb	C	-
An aldosterone antagonist such as spironolactone or eplerenone must be used if LVEF ≤40%.	I	B	282,314
Ultrafiltration should be considered.	IIa	B	315
Early revascularization must be considered if the patient has not been previously revascularized.	I	C	-
Treatment of cardiogenic shock (Killip class IV)			
Oxygen/mechanical respiratory support is indicated according to blood gases.	I	C	-
Urgent echocardiography/Doppler must be performed to detect mechanical complications, assess systolic function and loading conditions.	I	C	-
High-risk patients must be transferred early to tertiary centres.	I	C	-
Emergency revascularization with either PCI or CABG in suitable patients must be considered.	I	B	100
Fibrinolytics should be considered if revascularization is unavailable.	IIa	C	-
Intra-aortic balloon pumping may be considered.	IIb	B	1,98,305
LV assist devices may be considered for circulatory support in patients in refractory shock.	IIb	C	-
Haemodynamic assessment with balloon floating catheter may be considered.	IIb	B	316
Inotropic/vasopressor agents should be considered:			
• Dopamine	IIa	C	-
• Dobutamine	IIa	C	-
• Norepinephrine (preferred over dopamine when blood pressure is low).	IIb	B	300,317

ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; CABG = coronary artery bypass graft; i.v. = intravenous; LV = left ventricular; LVEF = left ventricular ejection fraction; PCI = percutaneous coronary intervention.

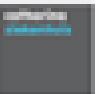
^aClass of recommendation.

^bLevel of evidence.

^cReferences.



-
- No clear answer for every question from guidelines
 - Culprit or all ? – No hard evidence
 - Assist ?- Maybe IABP ?????
 - Cool or not -Probably yes, but(can be troublesome in haemodynamic unstable patients)



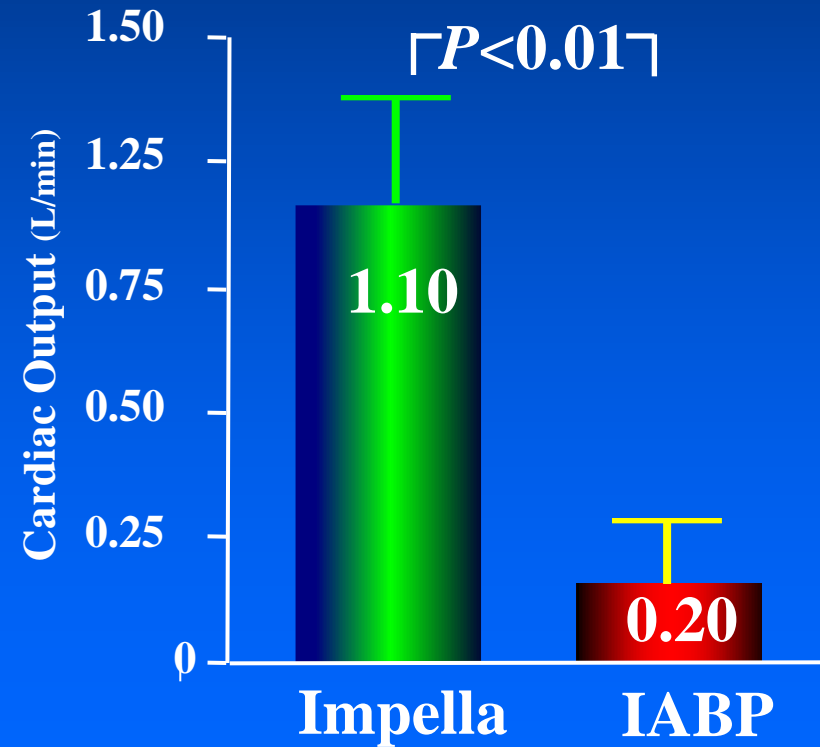
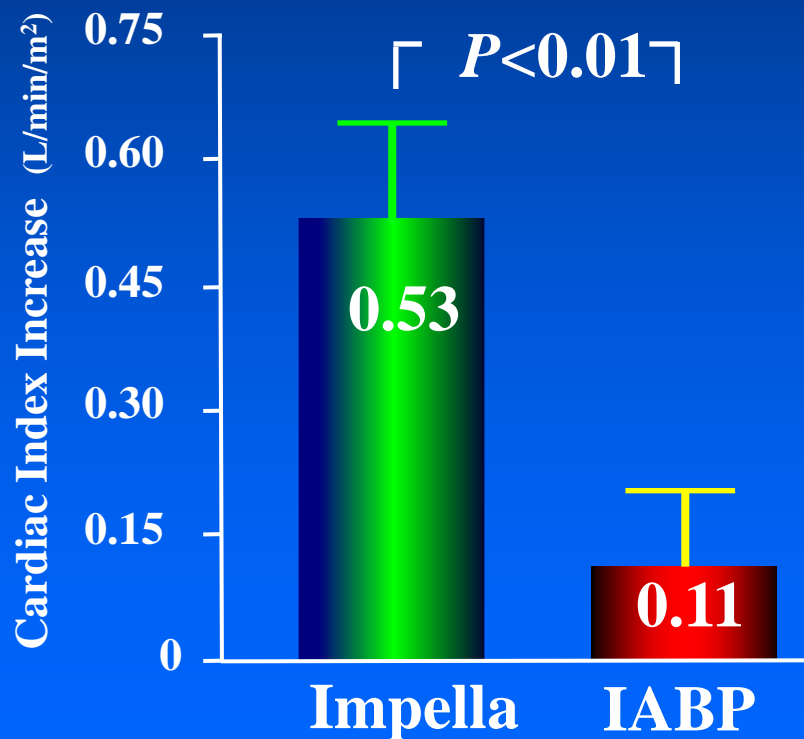
Guidelines ??????

- How to support ? IABP or
- Eccmo
- Impella

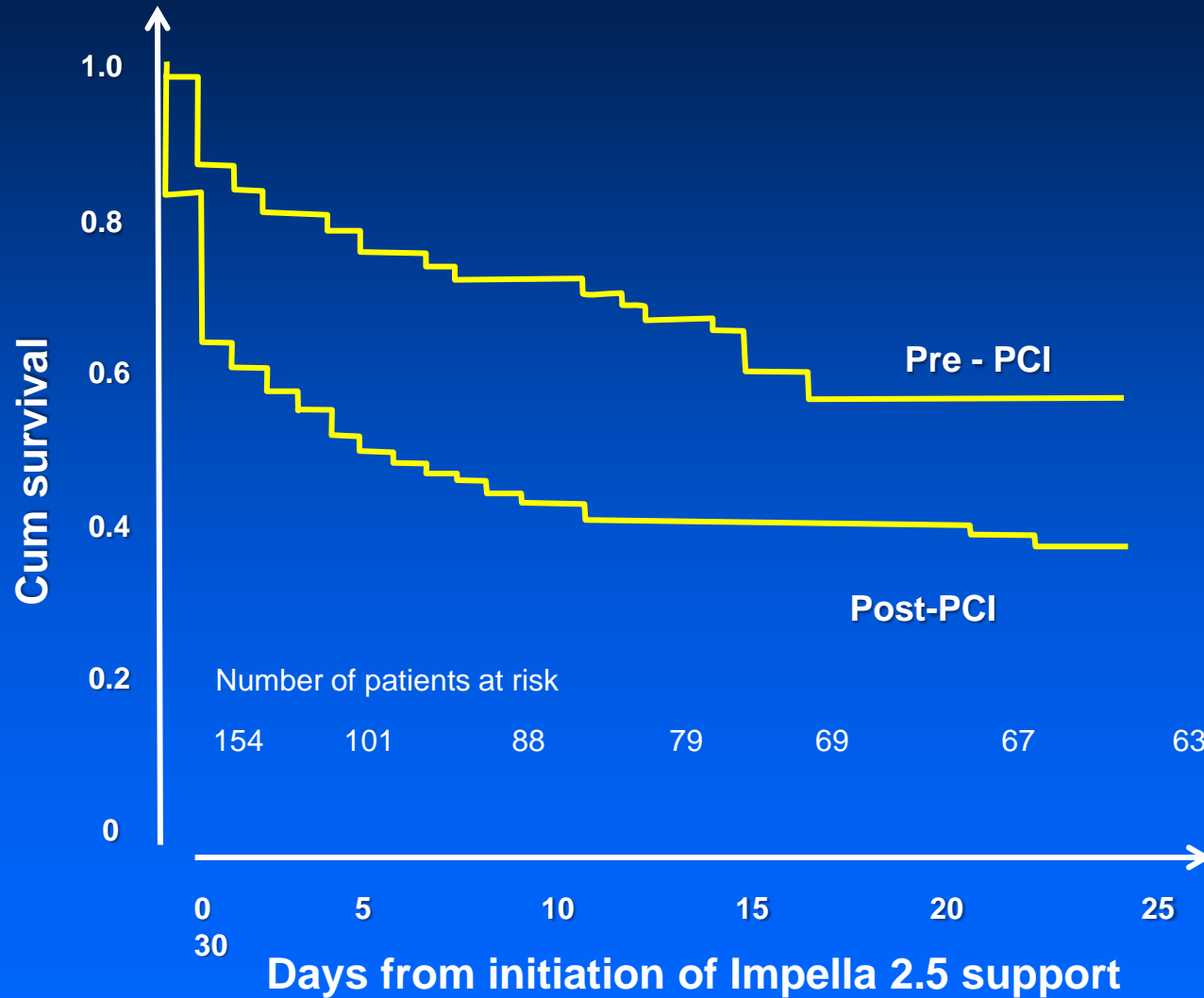


ISAR-SHOCK RANDOMIZED TRIAL: IMPELLA 2.5 vs. IABP in AMI Cardiogenic Shock

**Primary Endpoint:
Increase in Cardiac Index From Baseline
(measured after 20 min of support)**



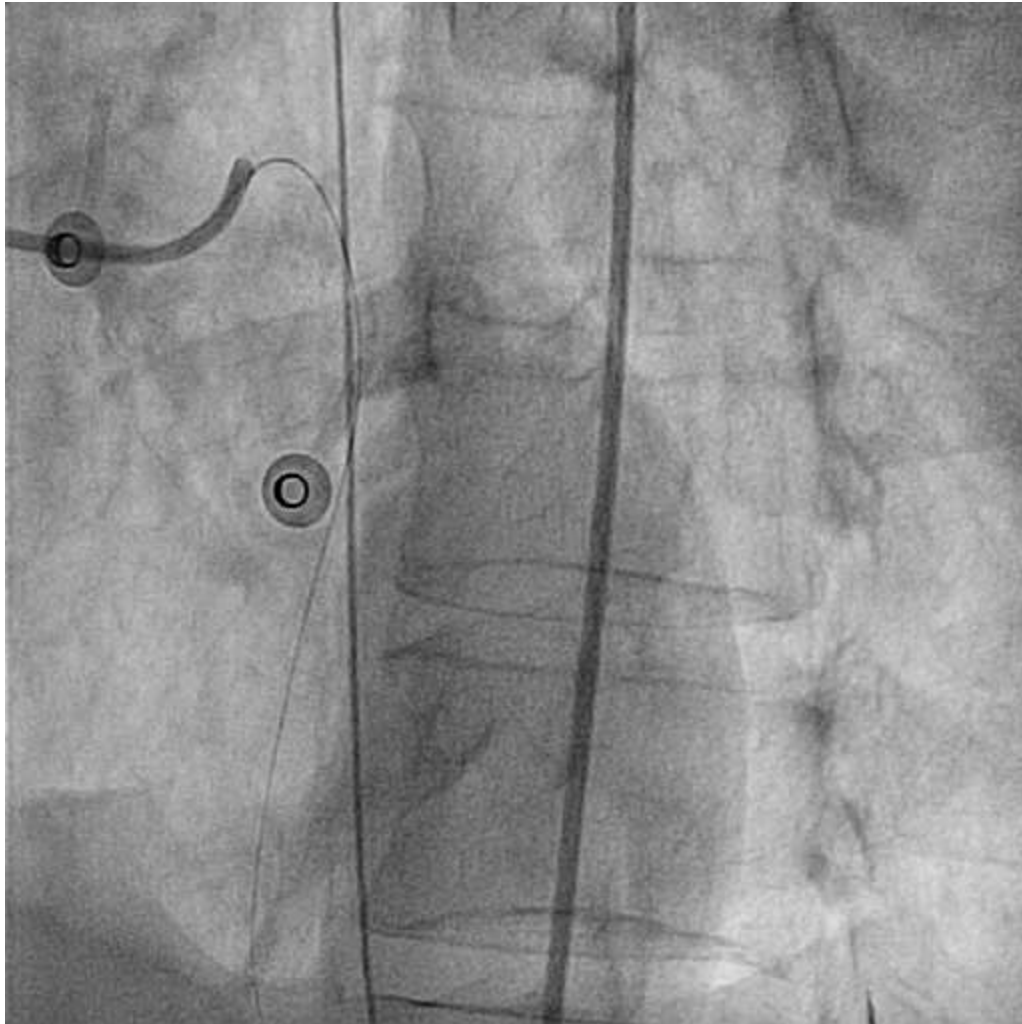
Survival improved when Impella placed prior to PCI for STEMI complicated by cardiogenic Shock

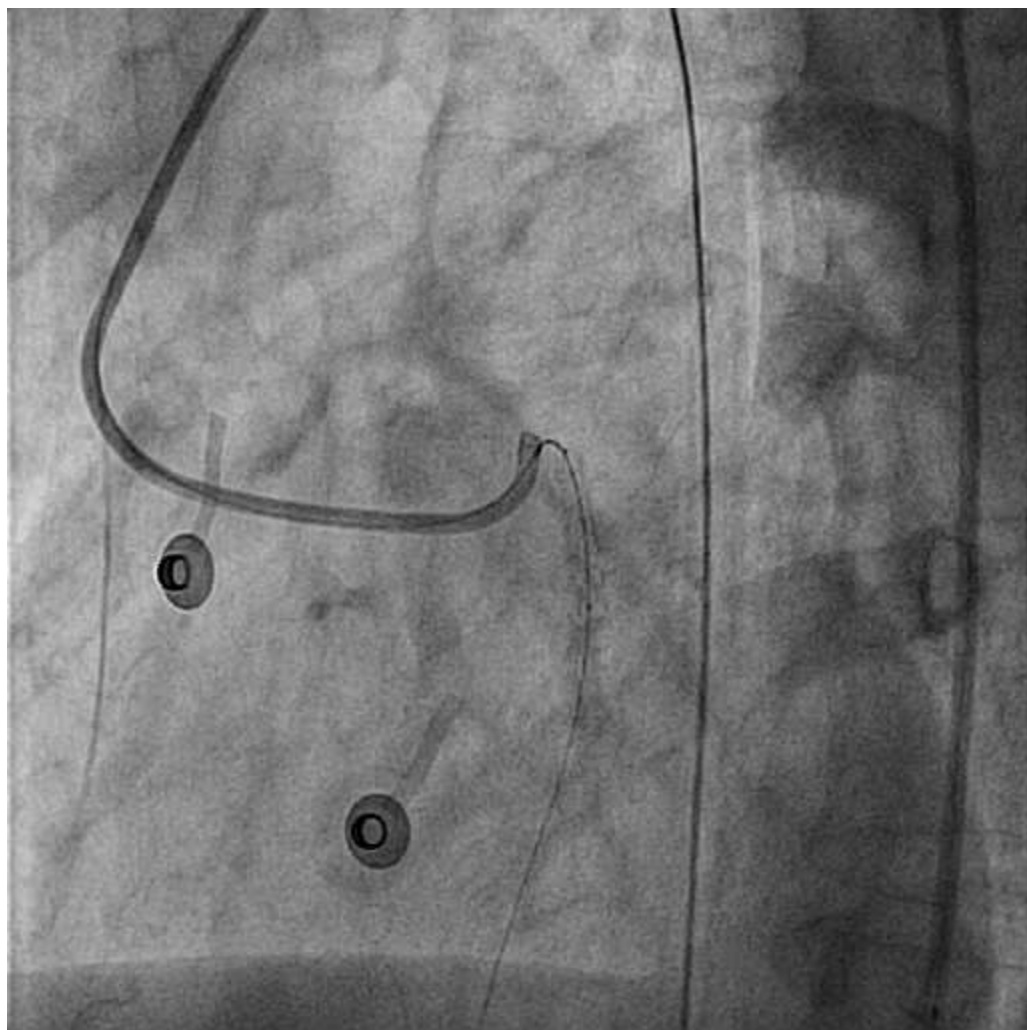


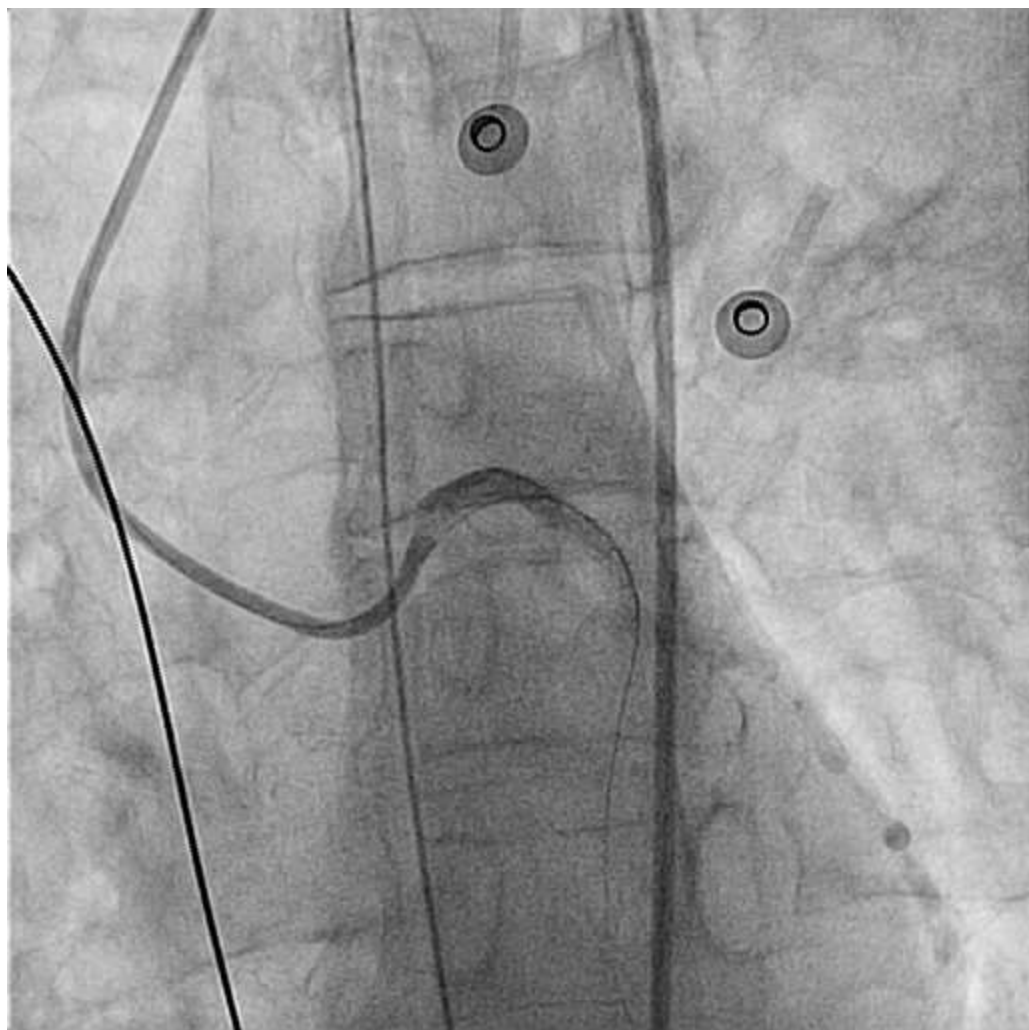
Acute MI and cardiogenic shock, including cardiac arrest out of hospital

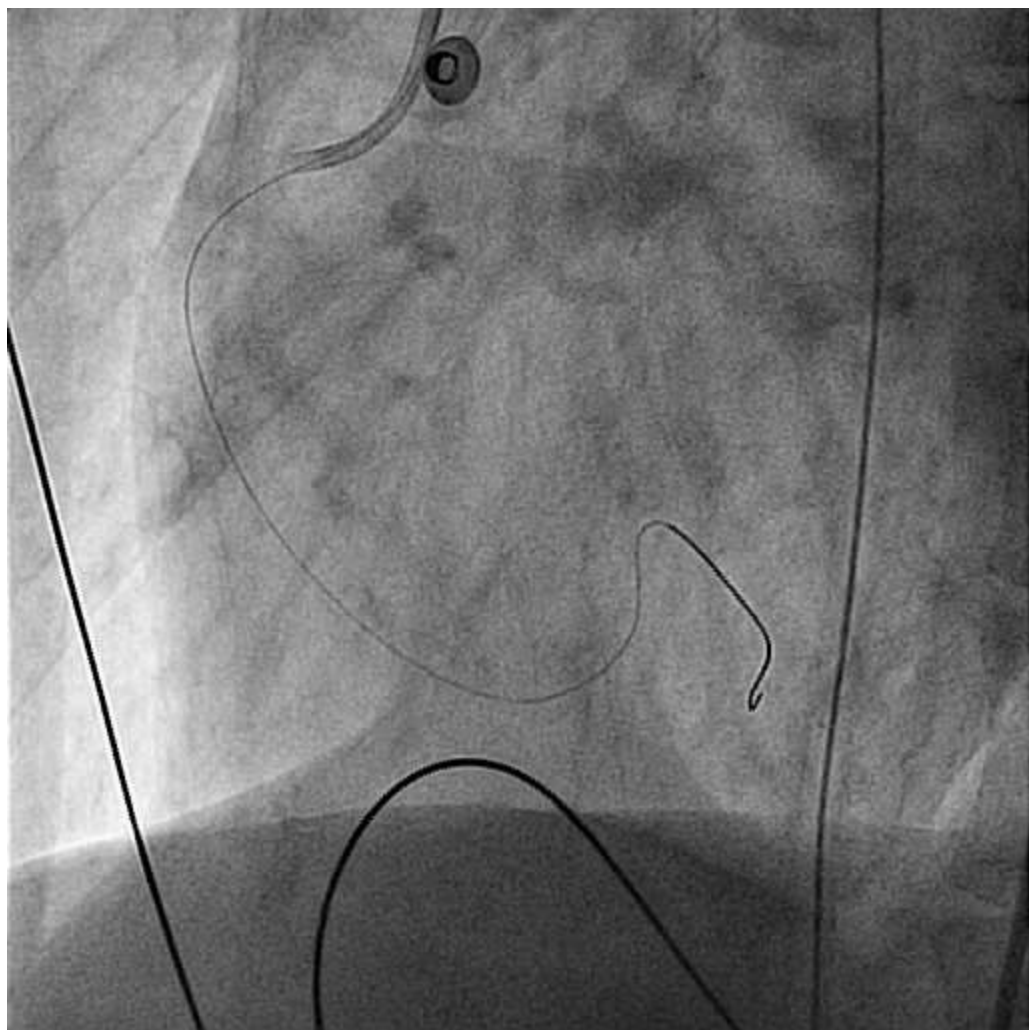
- Impella 32 Cardiogenic Shock pts in STEMI cases
- 18 x 2.5 l/min
- 15 x 4.0 l/min
- 3/18 survivors in 2.5 = 17 %
- 6/15 survivors in 4.0 = 40%

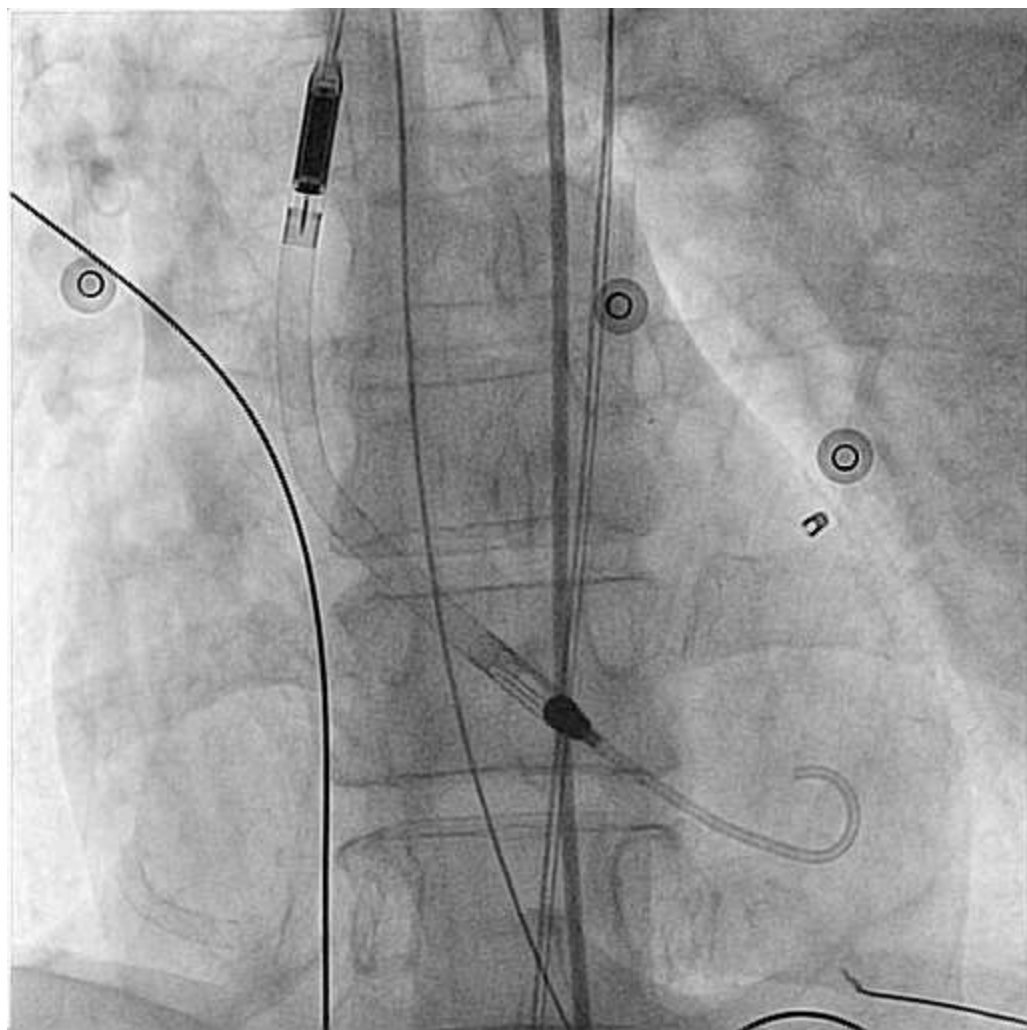












PHILIPS 25-07-1965

MI 1,0 6-12-2014

AA 25076510044

Catharina ZH

TIS 1,7 18:07:53

Adult Echo

S5-1

23Hz

19cm

2D

HGen

Gn 42

C 50

3 / 2 / 0

75 mm/s

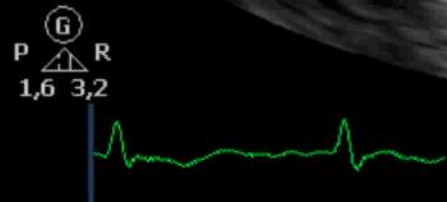
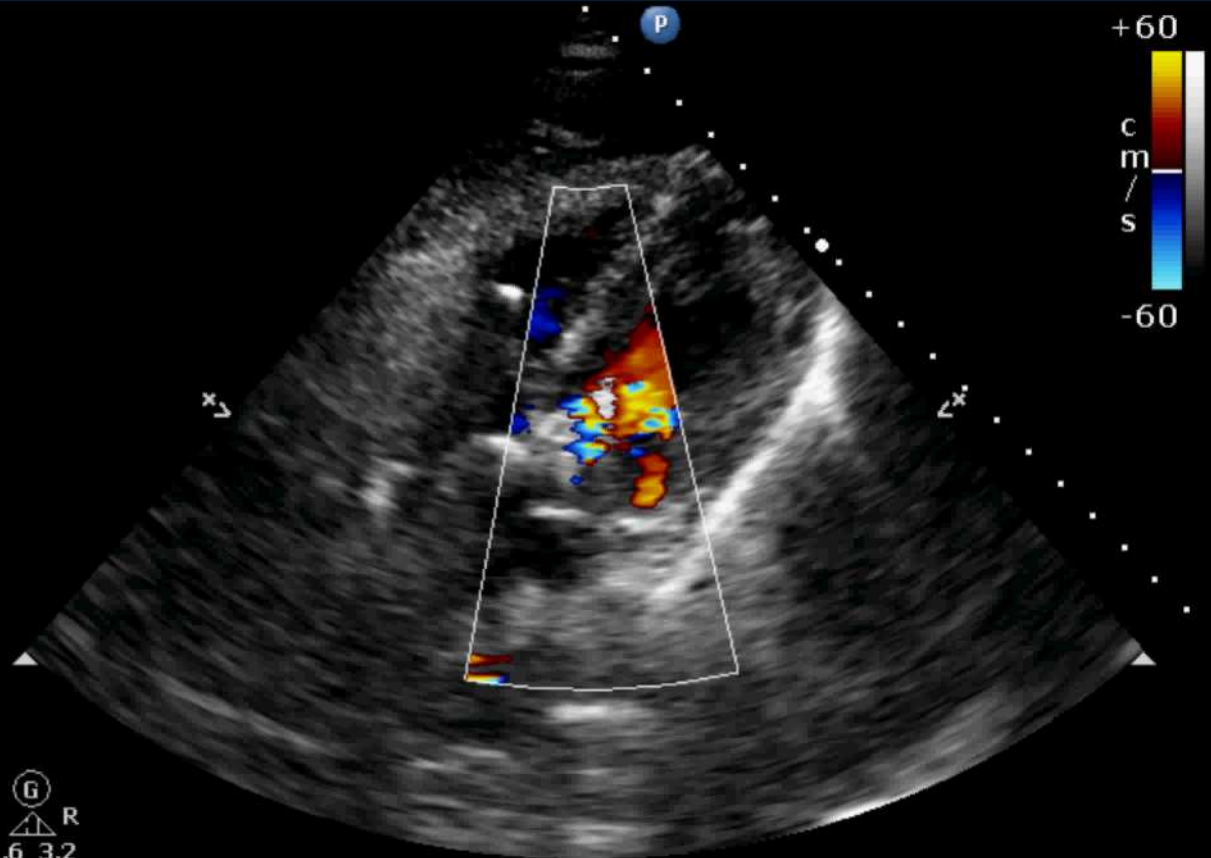
Color

2,5 MHz

Gn 60

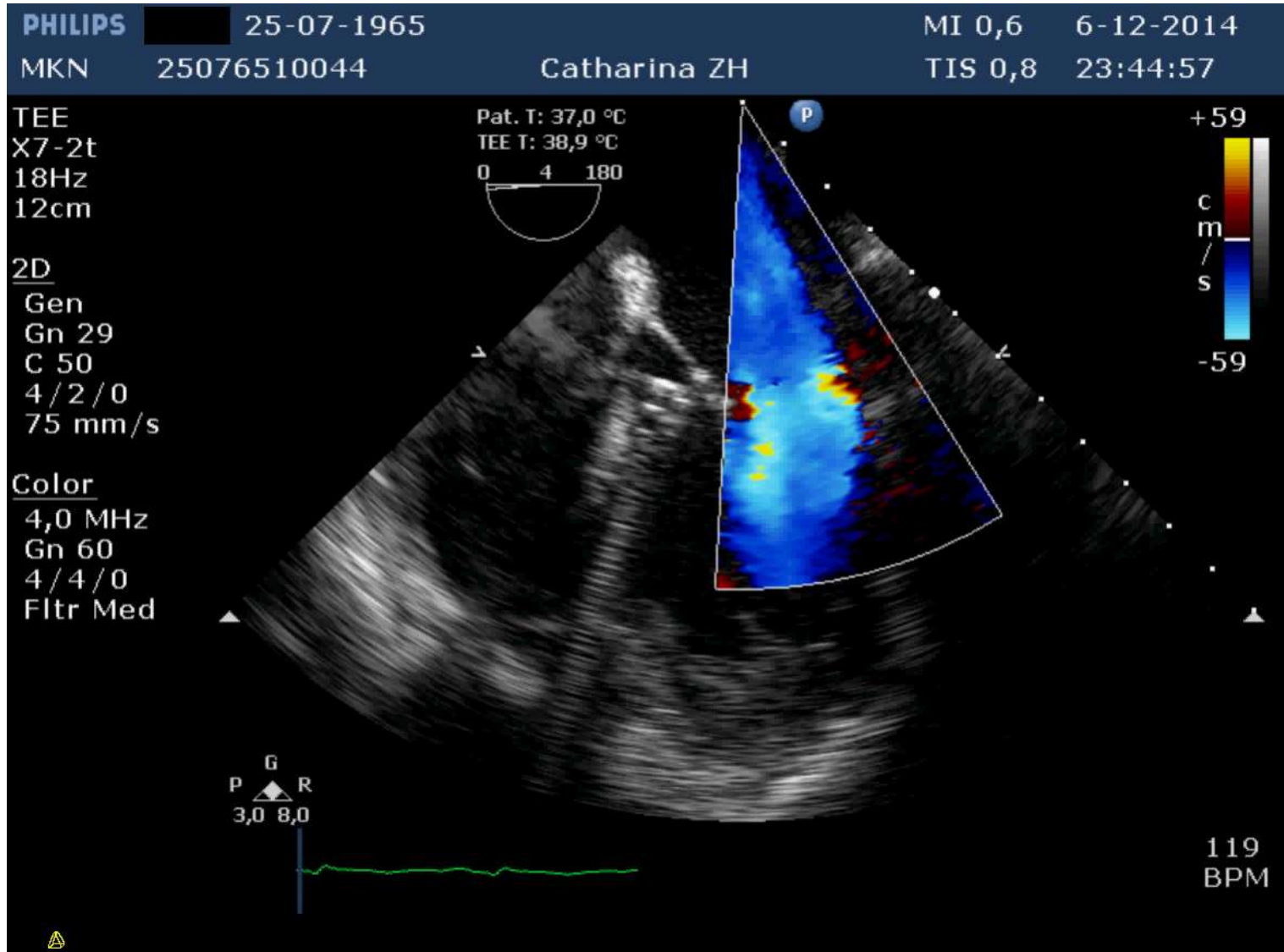
4 / 5 / 0

Fltr High



131
BPM





PHILIPS

25076510044

Catharina ZH

MI 0,6

9-12-2014

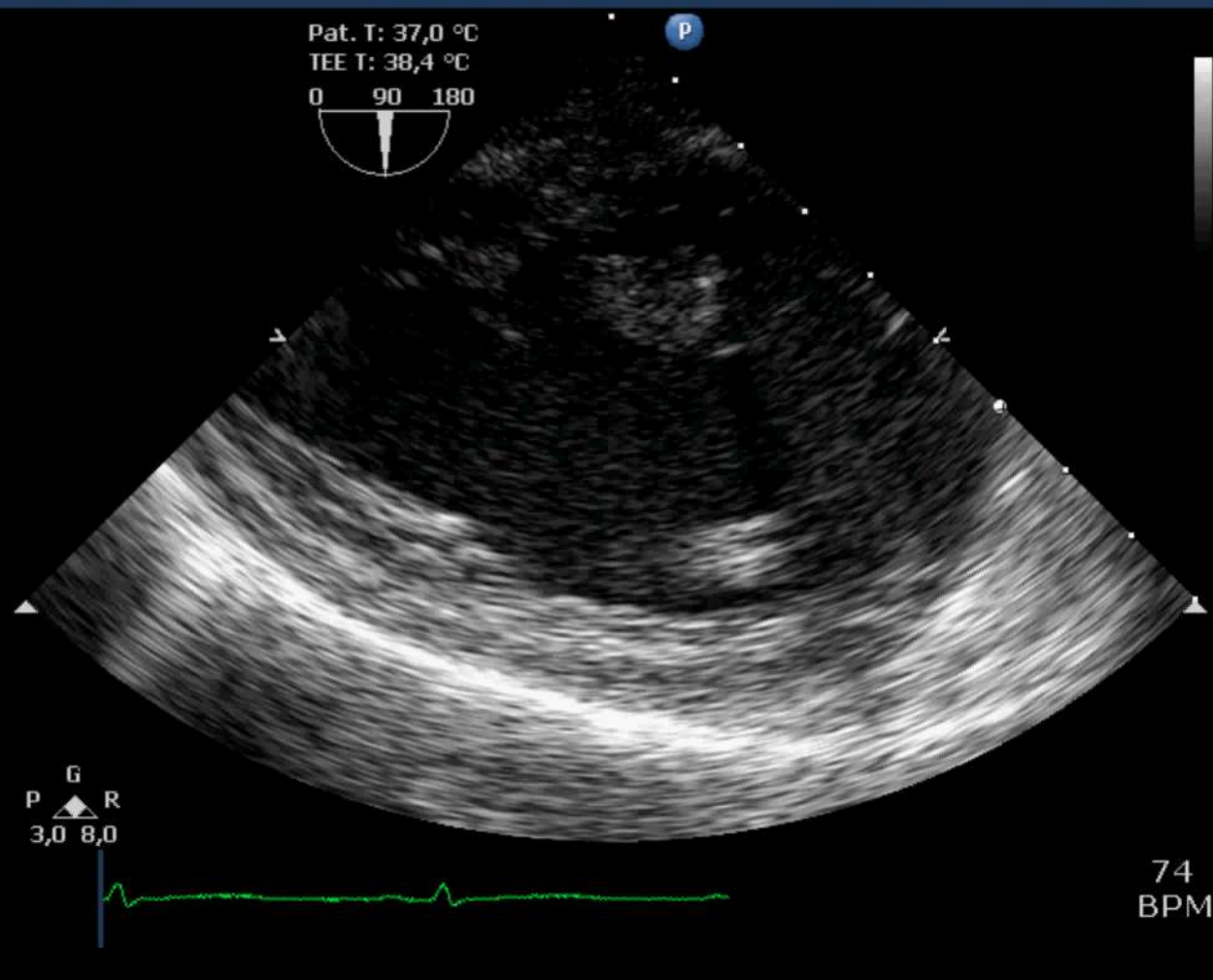
TIS 0,1

14:41:56

TEE
X7-2t
44Hz
9cm

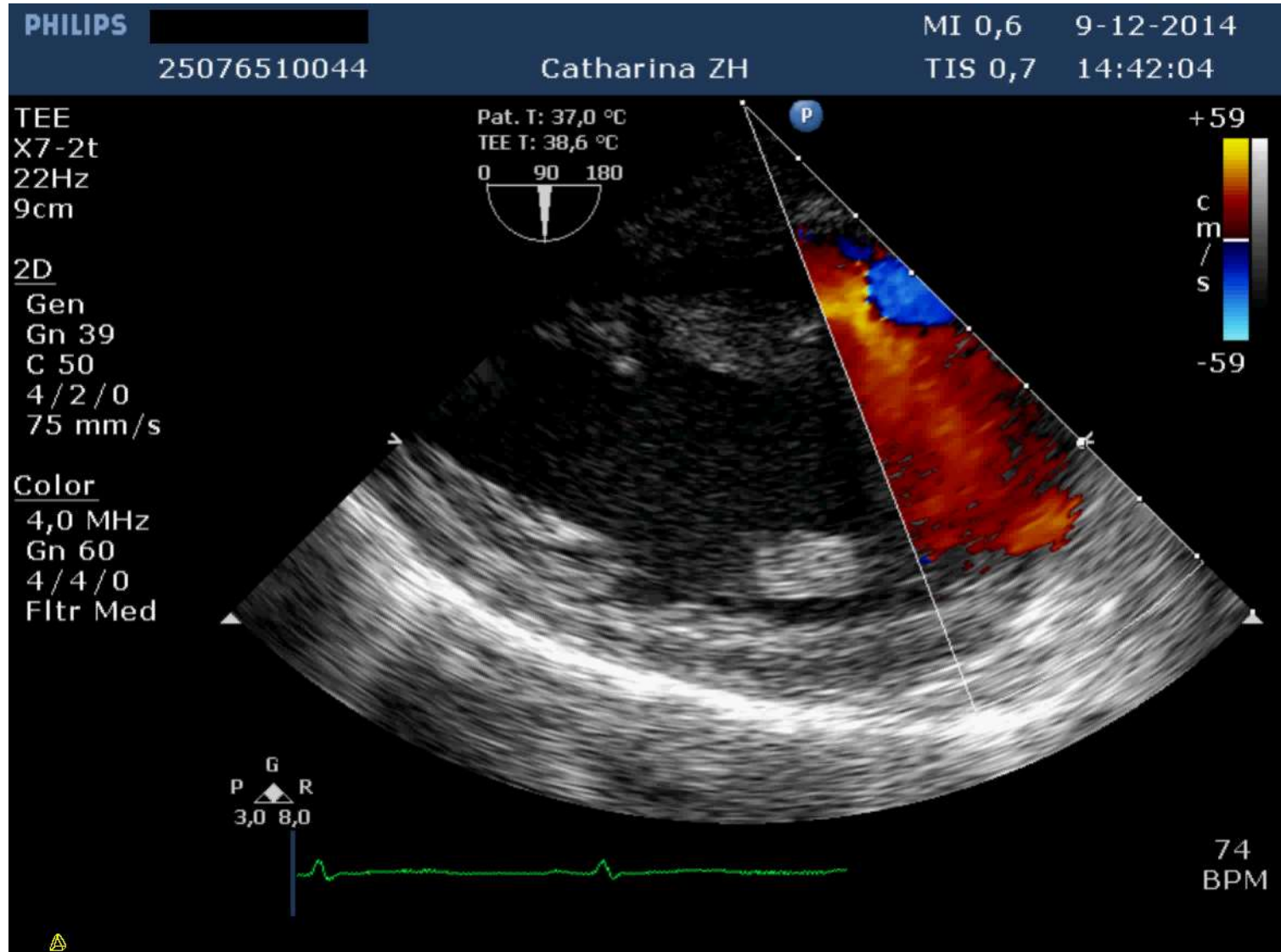
Pat. T: 37,0 °C
TEE T: 38,4 °C
0 90 180

2D
Gen
Gn 39
C 50
4 / 2 / 0
75 mm/s



74
BPM





PHILIPS

25076510044

Catharina ZH

MI 0,6

9-12-2014

TIS 0,7

14:45:08

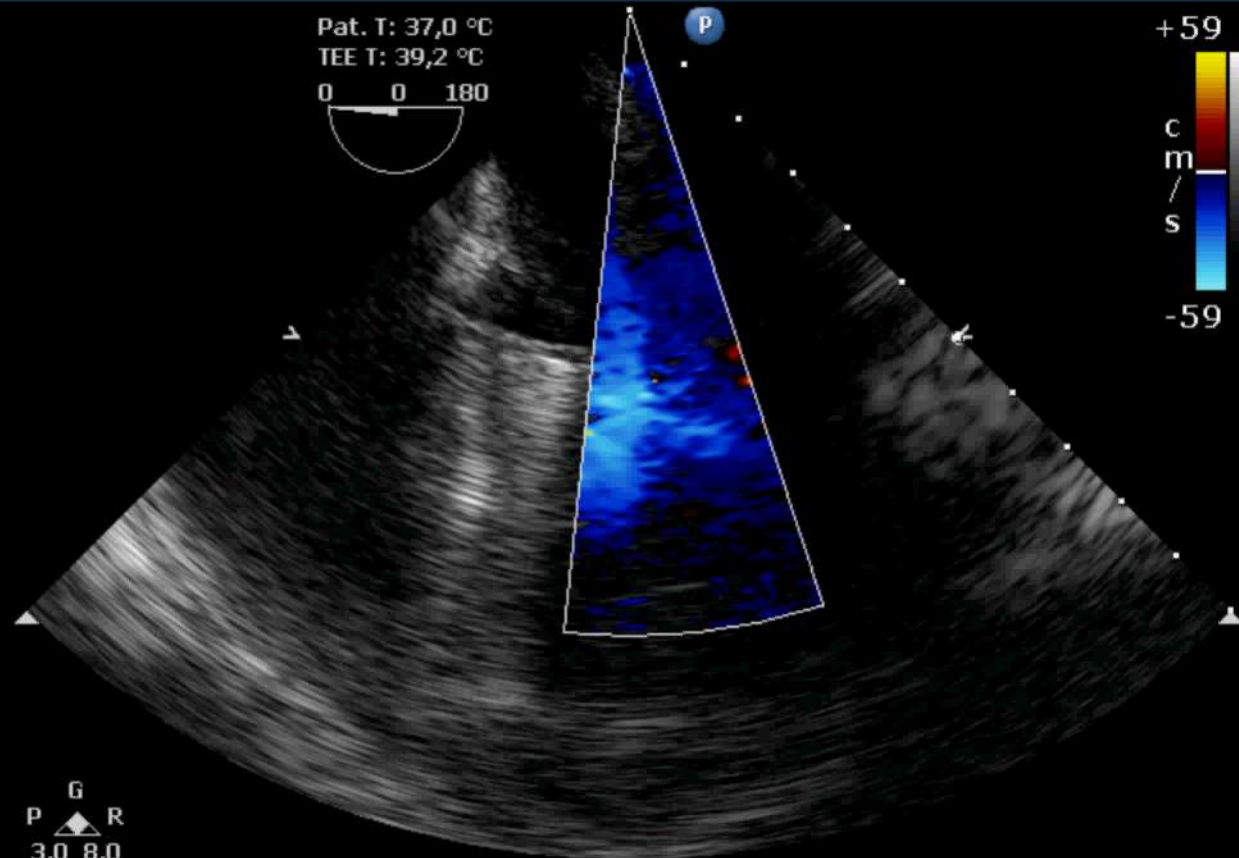
TEE
X7-2t
22Hz
11cm

Pat. T: 37,0 °C
TEE T: 39,2 °C
0 0 180

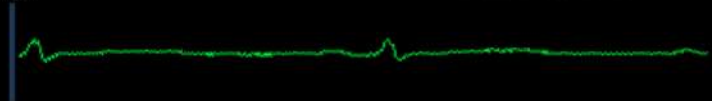
2D
Gen
Gn 39
C 50
4 / 2 / 0
75 mm/s

Color
4,0 MHz
Gn 60
4 / 4 / 0
Filtr Med

+59
c
m
/
s
-59



G
P ▲ R
3,0 8,0



70
BPM



PHILIPS

25076510044

17/12/2014

12:48:55

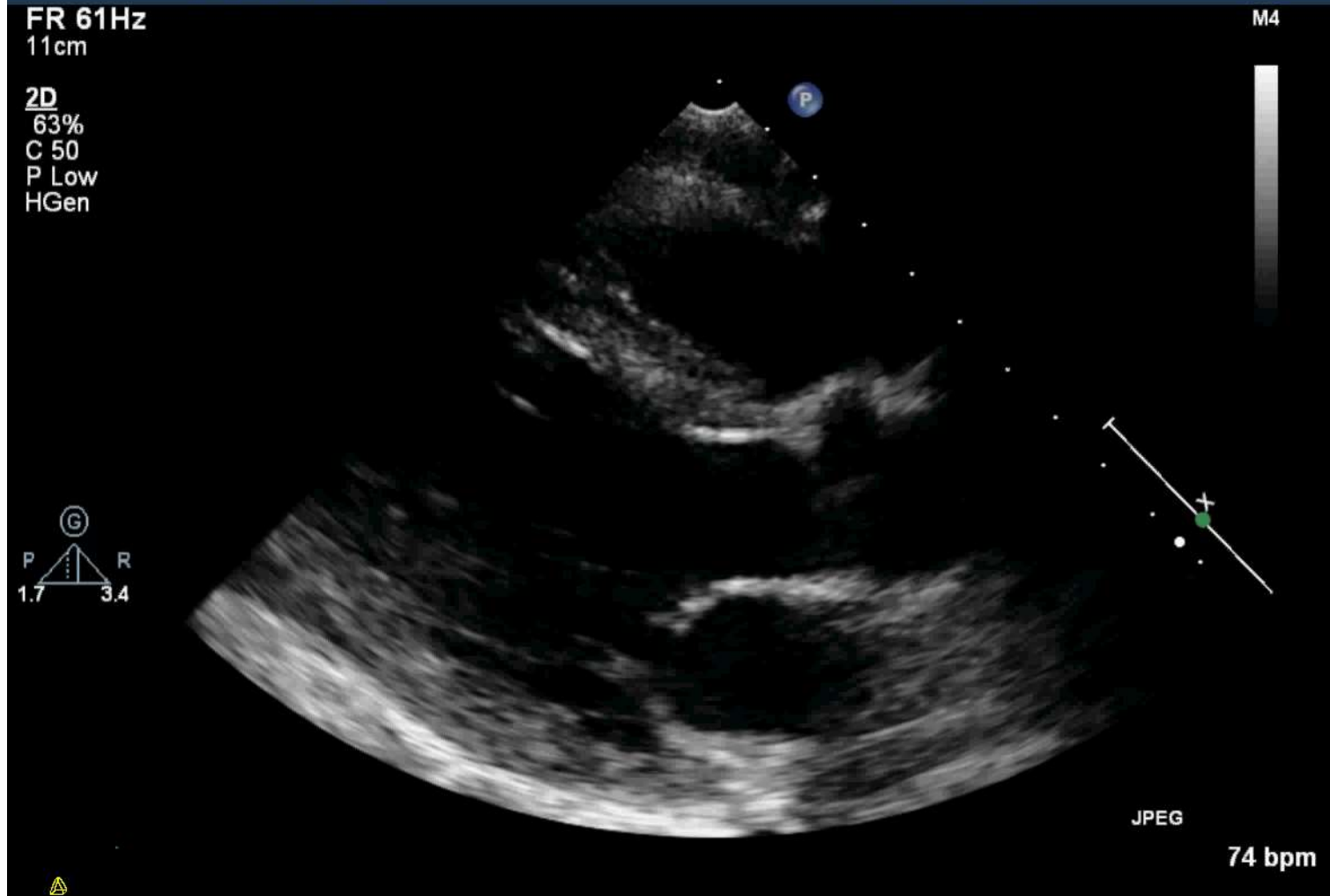
TIS1.0 MI 1.4

S5-1/Cardio

FR 61Hz
11cm

2D
63%
C 50
P Low
HGen

M4



JPEG

74 bpm



PHILIPS

25076510044

17/12/2014

12:51:44

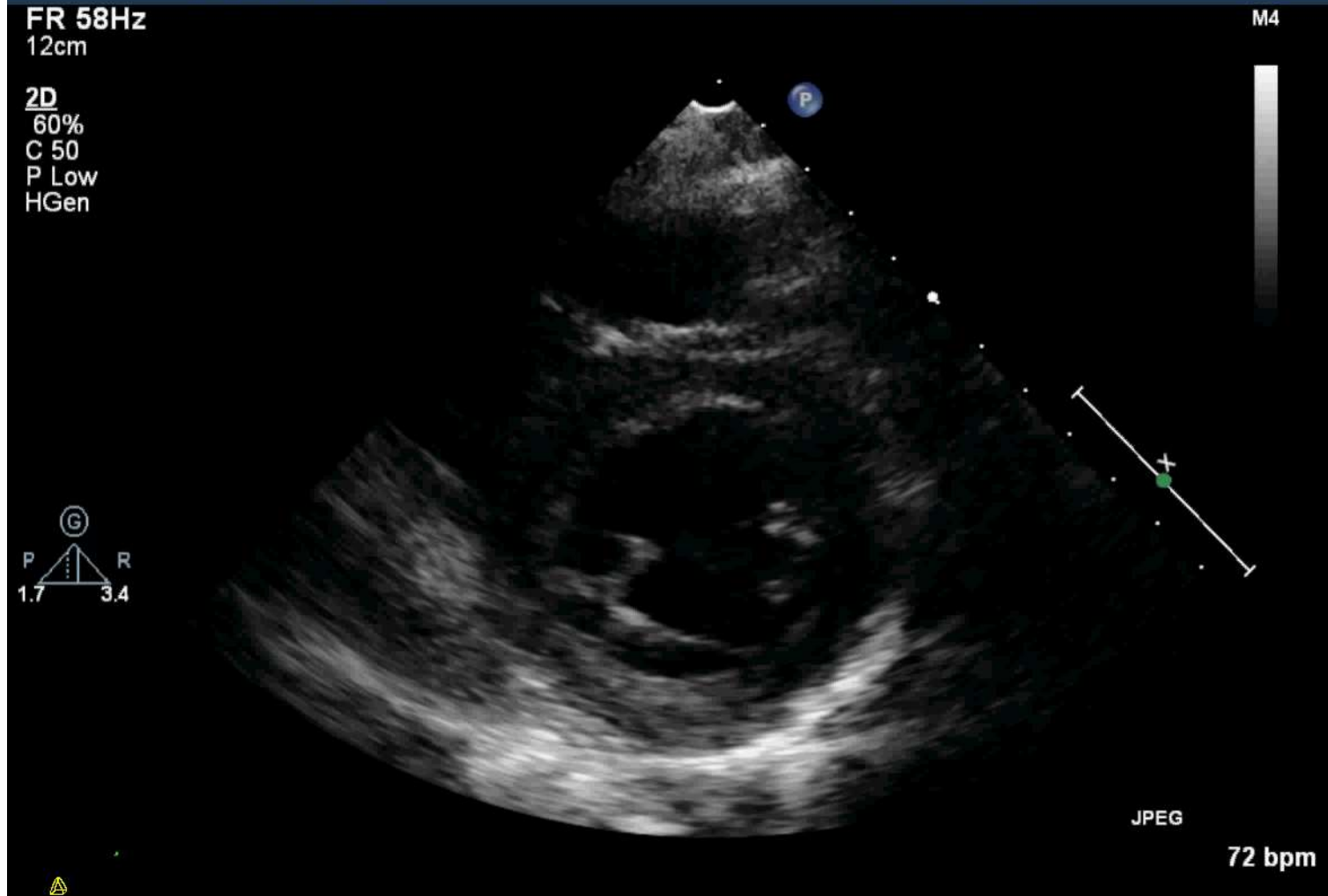
TIS1.1 MI 1.5

S5-1/Cardio

FR 58Hz
12cm

2D
60%
C 50
P Low
HGen

M4



JPEG

72 bpm



PHILIPS

25076510044

17/12/2014

12:52:08

TIS1.1 MI 1.5

S5-1/Cardio

FR 58Hz

12cm

2D

60%

C 50

P Low

HGen

M4



JPEG

69 bpm



PHILIPS

25076510044

17/12/2014

12:56:07

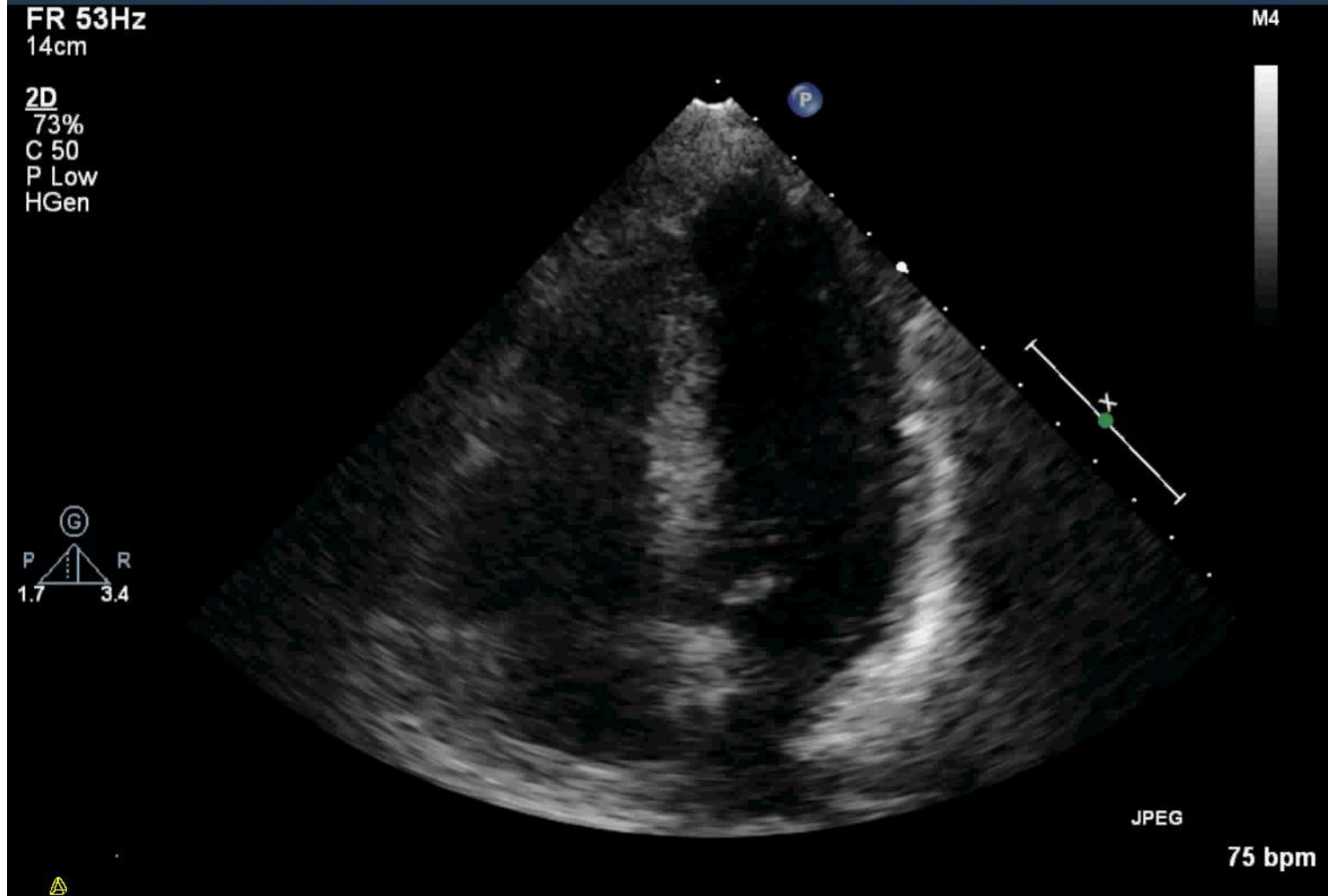
TIS1.0 MI 1.5

S5-1/Cardio

FR 53Hz
14cm

2D
73%
C 50
P Low
HGen

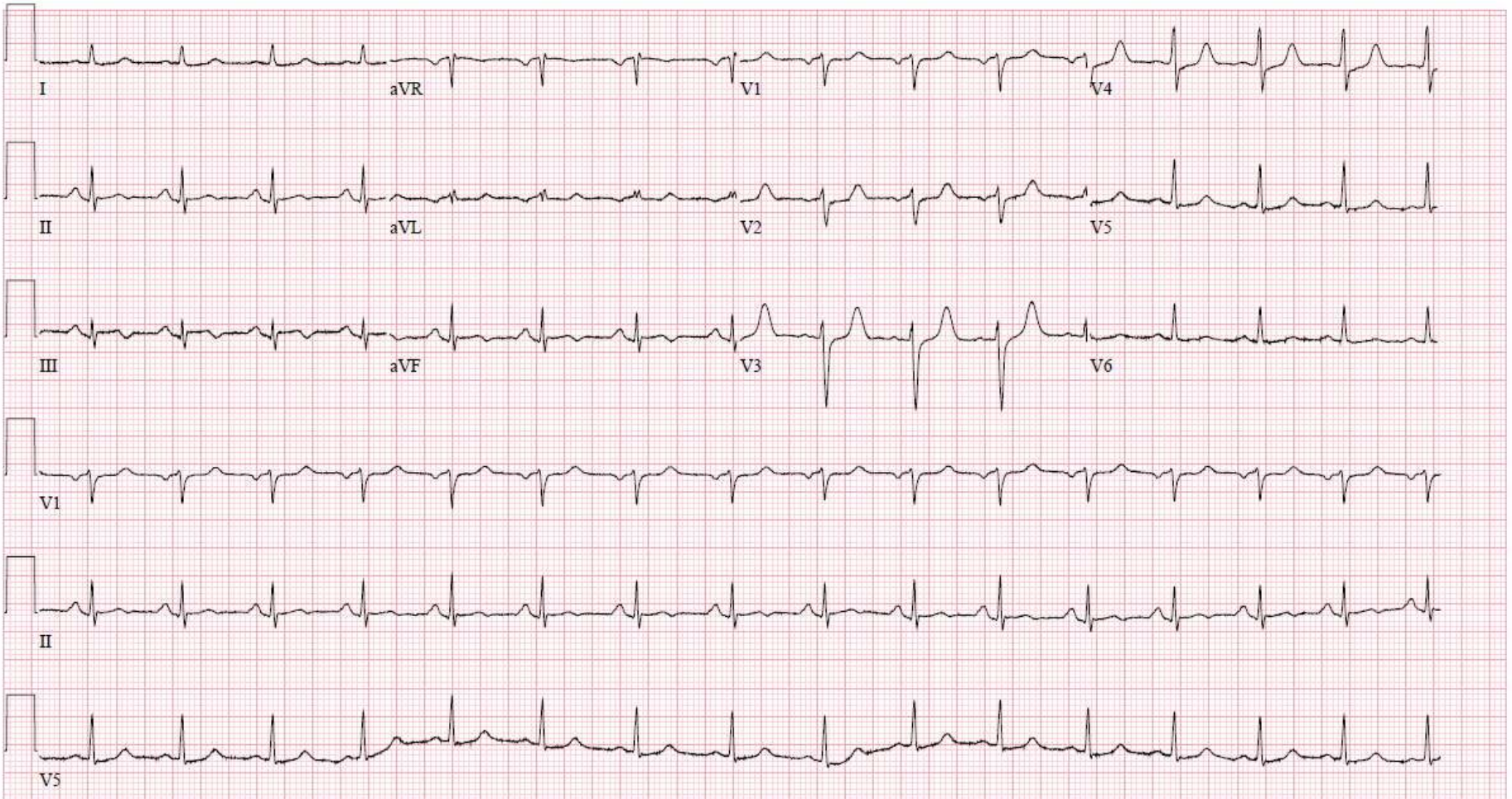
M4



JPEG

75 bpm





LESSONS Learned

- EARLY ARRIVAL
- CULPRIT/EVERYTHING !?!
- WHAT KIND OF SUPPORT !(Impella 4.0)
- Cool or not??!!
- Don t give up to early