# Use of GpIIbIIIa inhibitors on the ICCU

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ErasmusMC

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# Patient S

- Male age 67y
- Hypertension
- Paroxysmal AF
- Diabetes mellitus type-2
- Osteoarthritis

# Patient S

- Total knee replacement, long but uneventful procedure
- After surgery, on the orthopaedics ward:
  - **chest pain at rest**
  - “burning pressure”
  - spontaneous resolution
  - lasts 15 min
- BP **170/86mmHg**, T 36,8, O2 Sat 99% (air)
- Wt 80kg, Ht 1.76m
- Cardiovascular examination:  No murmurs or LVF
- ECG:  no ischaemia, but was recorded well after resolution of chest pain

# Patient S

- Medication:
  - Aspirin 80mg
  - Perindopril 4mg
  - Hydrochlorothyazide 25mg
  - Nifedipine 60mg od

  - Metformin 500 tds
  - Glimepiride 3mg

  - Omeprazole 40mg
  - Diclofenac 25mg tds
  - Meloxicam 15mg od
  - Paracetamol
  - Morfine prn

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# Patient S

- CXR:  no abnormality
- Haemoglobin:  5.5 mmol/l (lower limit 8.6)
- Creatinine 62 umol/l (eGFR=115 ml/min)
- Troponin 14ng/l (upper limit 13)

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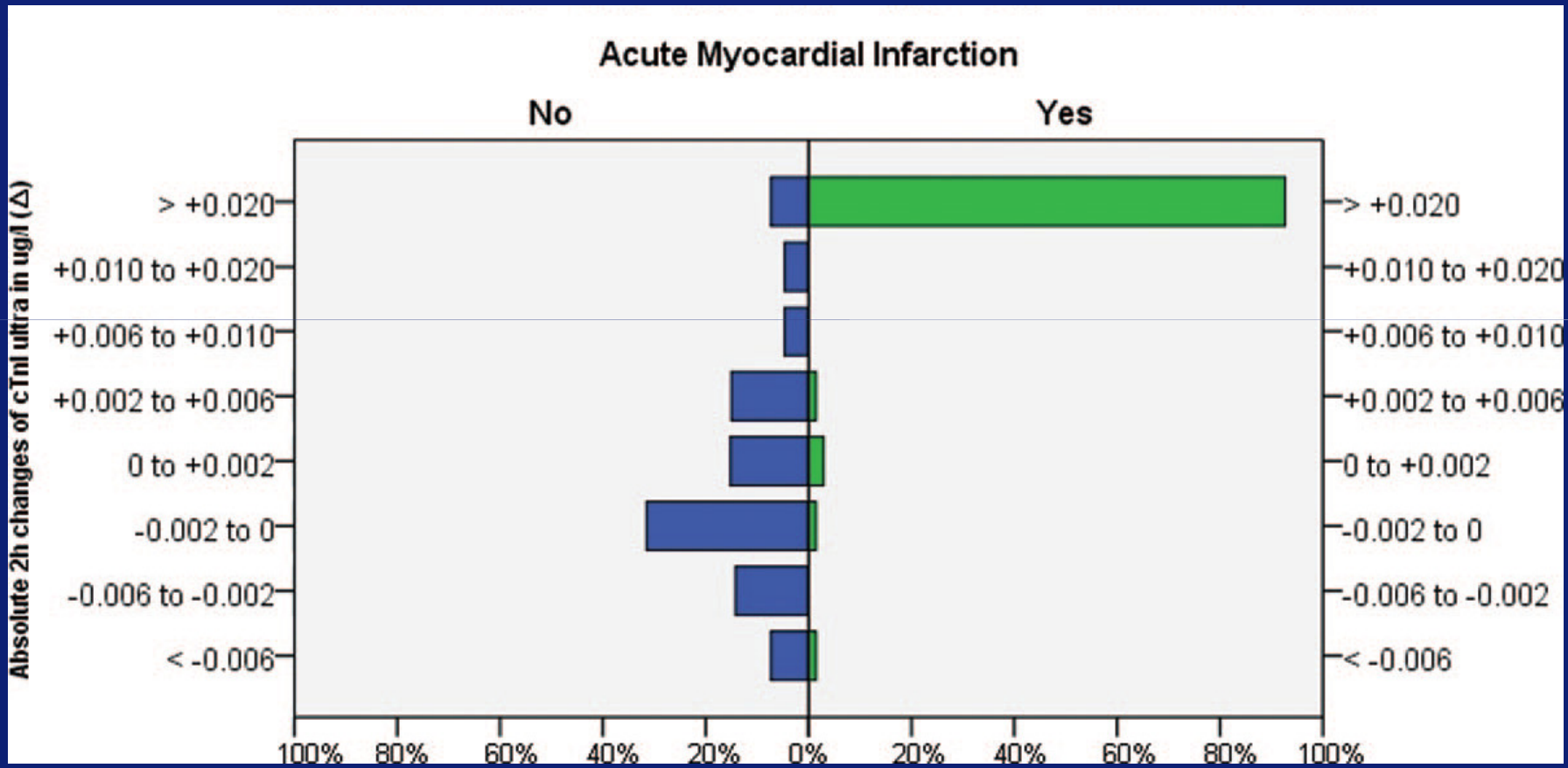
# Patient S

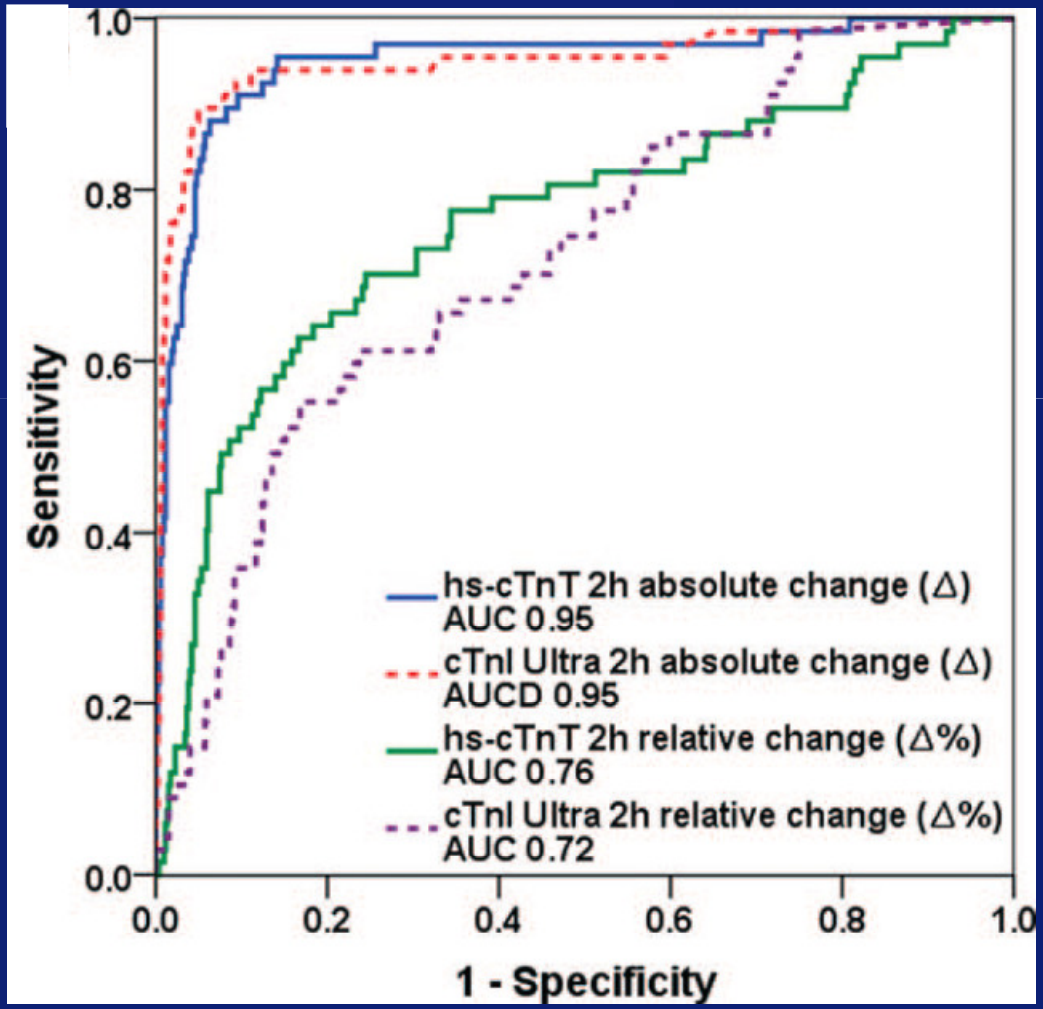
- hs-Troponin is repeated after 3h:  23ng/l

# Diagnosis of myocardial infarction with delta troponin




*T Reichlin et al, Circulation, 2011; 124:136-145*

# Diagnosis of myocardial infarction with delta troponin




*T Reichlin et al, Circulation, 2011; 124:136-145*

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# Patient S

- Delta hsTroponin=9ng/l
- Diagnosis: NSTEMI

# How would you classify this myocardial infarction?

1) Type 1
2) Type 2
3) Type 3
4) Type 4
5) Type 5

Q1

# How would you classify this myocardial infarction?

1) Type 1: plaque event
2) Type 2: imbalance of O2 demand/supply
3) Type 3: sudden cardiac death
4) Type 4: PCI & stent thrombosis
5) Type 5: CABG

# Patient S

- Cardiac event associated with a hypertensive episode plus low haemoglobin
- Universal definition of Myocardial Infarction Type-2:
  - infarction secondary to ischaemia due to increased oxygen demand or decreased supply

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# Patient S

- Given 2 units of packed red cells
- Continued anti-hypertensives,
- Increased analgesia:  BP improved in the range of 142/80mmHg

# What is your next step?

1) coronary angiography before discharge
2) elective cor. angiography after discharge
3) MSCT
4) stress test
5) simvastatin & clopidogrel and review in clinic once fully mobile

Q2

# Patient S: Pre-test probability of coronary disease

- Reynolds risk score: High pre-test probability of coronary disease

# Patient S: Grace Score

| Probability of | Death | Death or MI |
|---|---|---|
| In hospital | 4% | 18% |
| Up to 6 months | 9% | 27% |

High risk

# ESC Guidelines: NSTEMI

**Recommendations for invasive evaluation and revascularization**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| An invasive strategy (within 72 h after first presentation) is indicated in patients with:<br>• at least one high-risk criterion (*Table 9*);<br>• recurrent symptoms. | I | A | 148 |
| **Urgent** coronary angiography (<2 h) is recommended in patients at very high ischaemic risk (refractory angina, with associated heart failure, life-threatening ventricular arrhythmias, or haemodynamic instability). | I | C | 148, 209 |
| An **early** invasive strategy (<24 h) is recommended in patients with a GRACE score >140 or with at least one primary high-risk criterion. | I | A | 212, 215 |

**Table 9 Criteria for high risk with indication for invasive management**

| Primary |
|---|
| • Relevant rise or fall in troponin[a]<br>• Dynamic ST- or T-wave changes (symptomatic or silent) |
| **Secondary** |
| • Diabetes mellitus<br>• Renal insufficiency (eGFR <60 mL/min/1.73 m²)<br>• Reduced LV function (ejection fraction <40%)<br>• Early post infarction angina<br>• Recent PCI<br>• Prior CABG<br>• Intermediate to high GRACE risk score (*Table 5*) |

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# Patient S

- Additional medication
  - Clopidogrel 600mg (75mg)
  - Dalteparin 7500IE twice daily
  - Simvastatin 40mg
  - (already on aspirin, perindopril)

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# Patient S

- Later that day:
  - further chest pain on trying to get out of bed
  - lasting 25 min
  - relieved by sublingual nitrates
- ECG:  diffuse ischaemia, rapidly normalized when chest pain disappears

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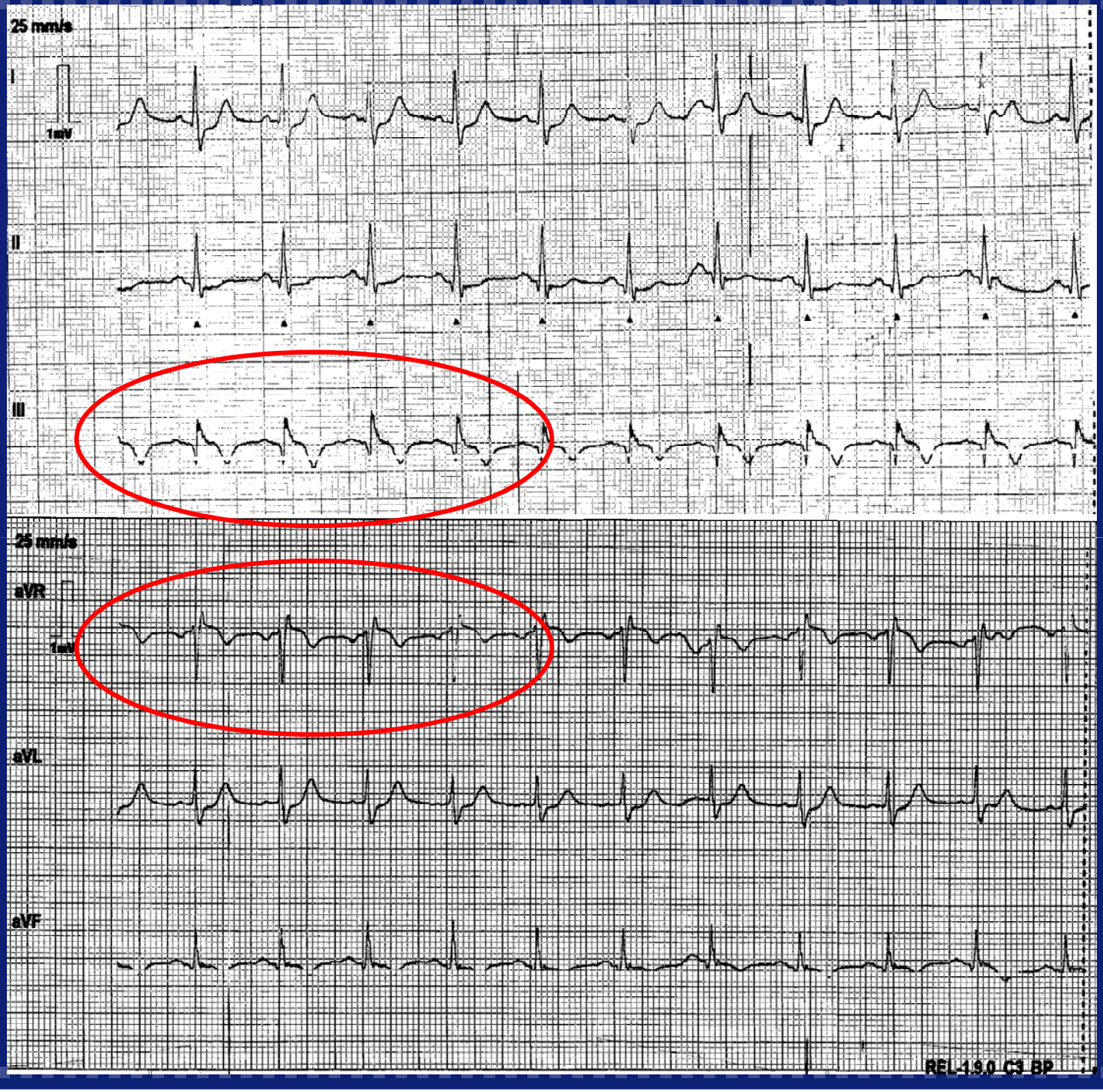

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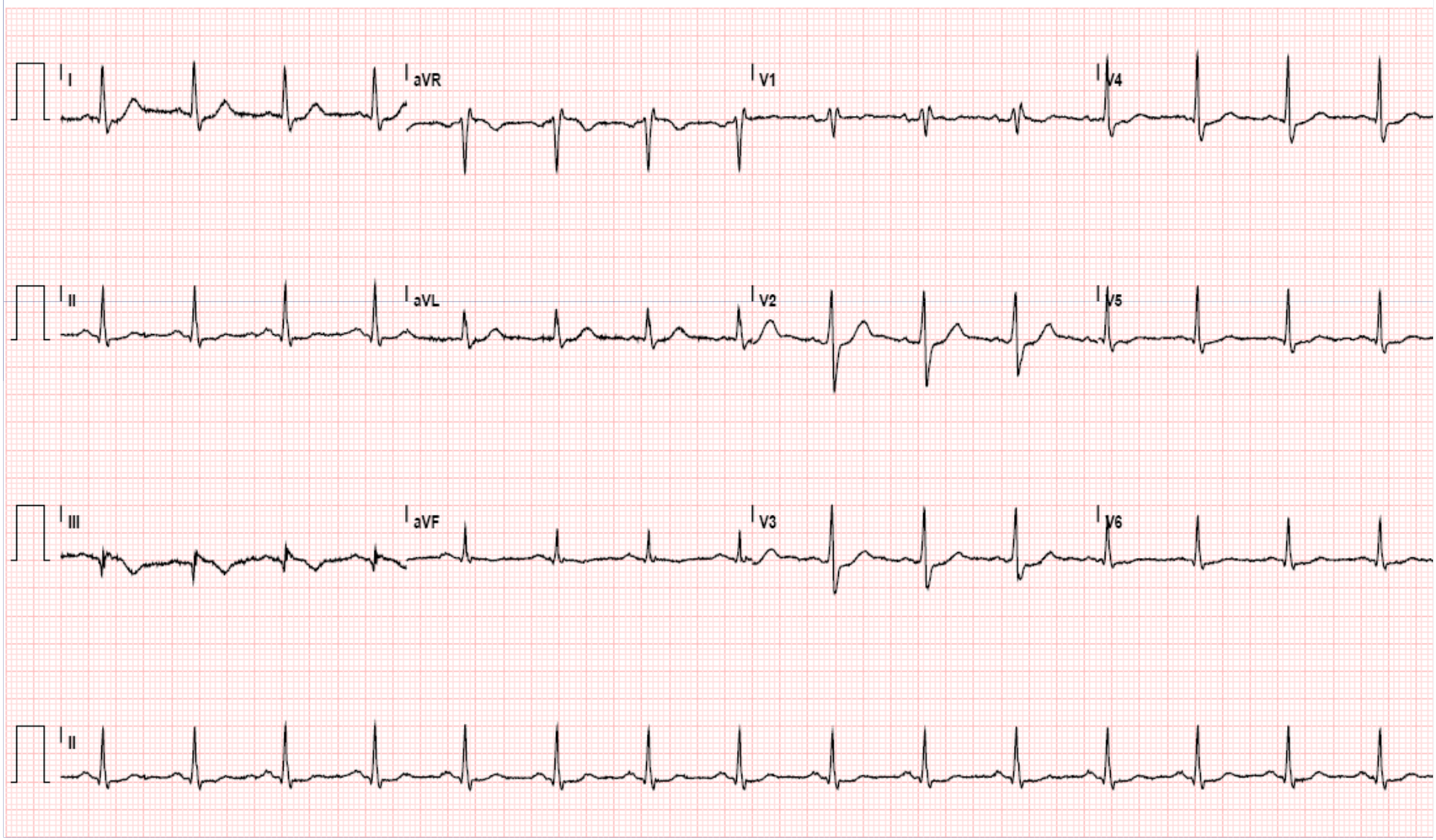
# Patient S: chest pain resolved



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# Patient S

- Urgent cath list (<24h)
- Transferred to ICCU
  - Telemetry
  - Serial cardiac markers
  - Echocardiography:
    - good LV
    - no regional wall motion abnormalities

# How would you optimise medical Rx

1) add B-Blocker
2) switch from clopidogrel to prasugrel
3) switch simva 40mg to atorva 80mg
4) GpIIbIIIa inhibitor I.V.
5) all of the above

Q3

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# ESC Guidelines: NSTEMI

**Recommendations for GP IIb/IIIa receptor inhibitors**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| The choice of combination of oral antiplatelet agents, a GP IIb/IIIa receptor inhibitor, and anticoagulants should be made in relation to the risk of ischaemic and bleeding events. | I | C | - |
| Among patients who are already treated with DAPT, the addition of a GP IIb/IIIa receptor inhibitor for high-risk PCI (elevated troponin, visible thrombus) is recommended if the risk of bleeding is low. | I | B | 152, 161 |
| Eptifibatide or tirofiban added to aspirin should be considered prior to angiography in high-risk patients not preloaded with $P2Y_{12}$ inhibitors. | IIa | C | - |
| In high-risk patients eptifibatide or tirofiban may be considered prior to early angiography in addition to DAPT, if there is ongoing ischaemia and the risk of bleeding is low. | IIb | C | - |
| GP IIb/IIIa receptor inhibitors are not recommended routinely before angiography in an invasive treatment strategy. | III | A | 151, 170 |
| GP IIb/IIIa receptor inhibitors are not recommended for patients on DAPT who are treated conservatively. | III | A | 150, 151 |

# How would you rate the bleeding risk of this patient?

1) low

2) moderate

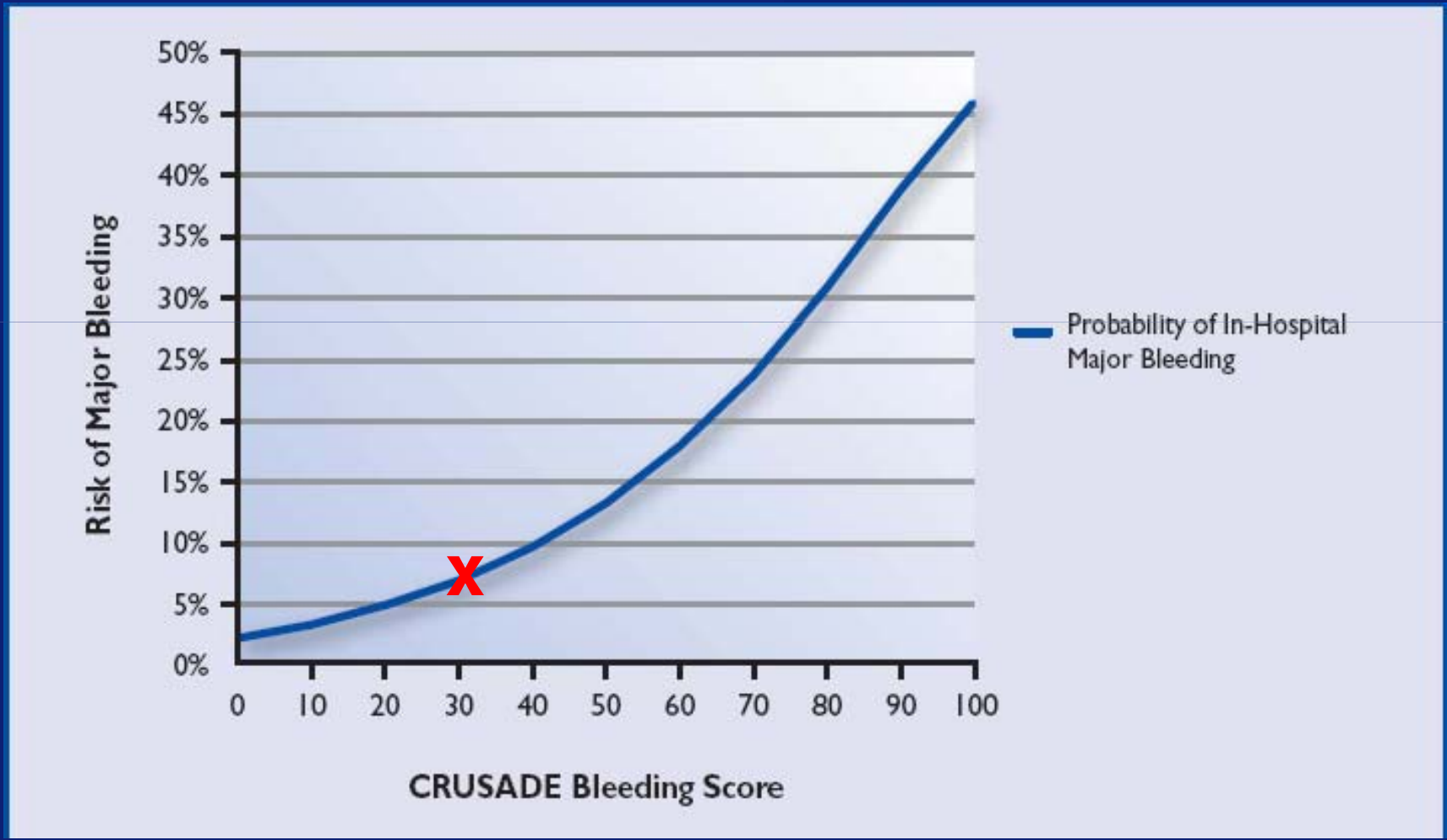
3) high

Q4

# Patient S: CRUSADE Bleeding Score

- 33- Moderate risk
  - Hematocrit <31
  - GFR 91-120
  - Heart rate 111-120
  - SBP 121-180
  - Diabetes Mellitus
  - Male
- Risk of in hospital major bleeding 7.4%

# Bleeding risk based on CRUSADE



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# Patient S

- The following morning:
- Chest pain at rest
- ECG:  pan-ischaemia

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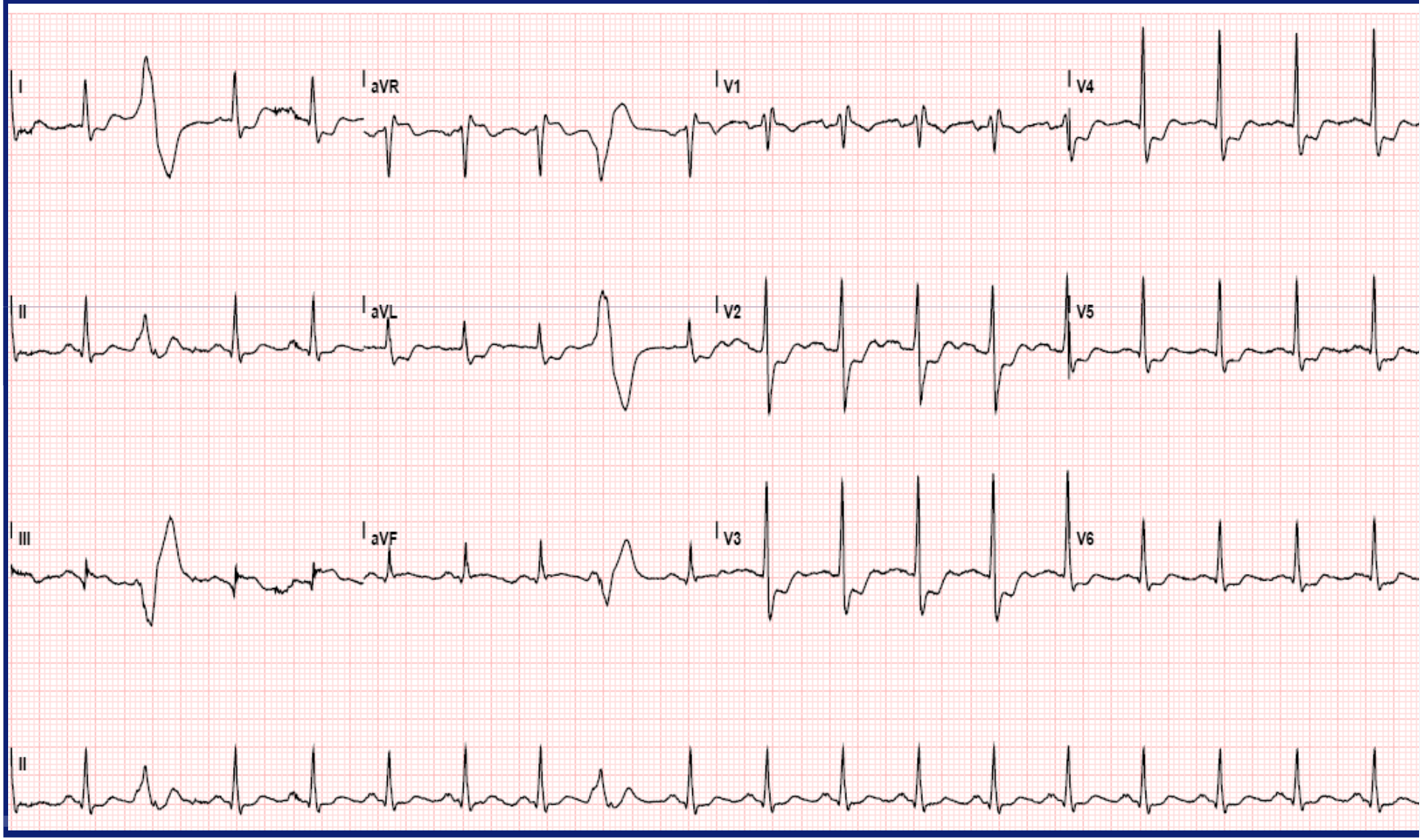
# Patient S: on IV nitrates



# Patient S

- IV nitrates – persistent pain
- Cath lab:
  - Is busy with procedures
  - Patient S will be next
  - Anticipate a delay of 30-40 minutes

# ESC Guidelines in this situation

**Recommendations for GP IIb/IIIa receptor inhibitors**

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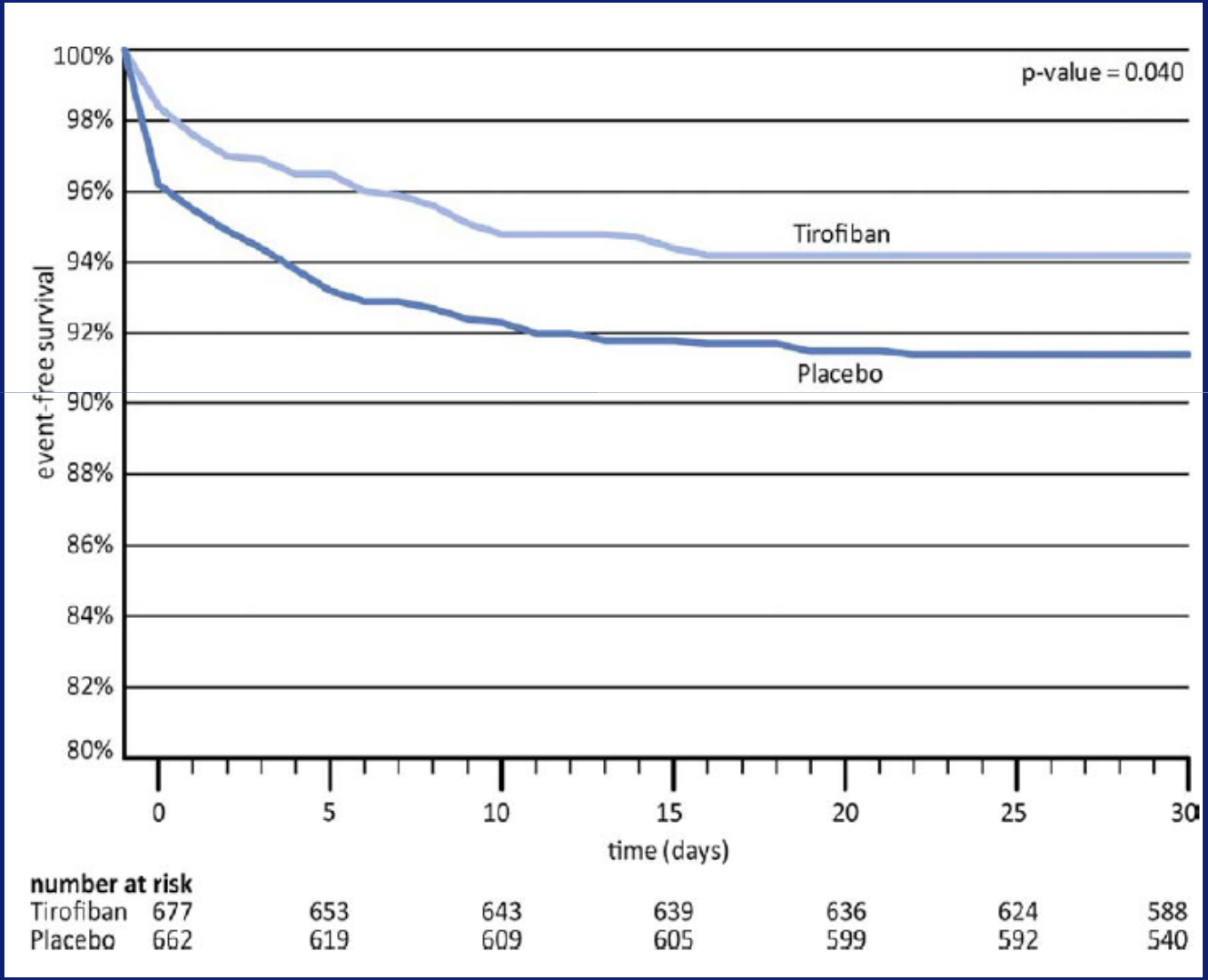
# OnTIME-2 trial



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# Patient S

- On the cath lab table 50 min after onset of symptoms
- Pulse=98
- BP=148/90mmHg
- Saturations= 98% on air

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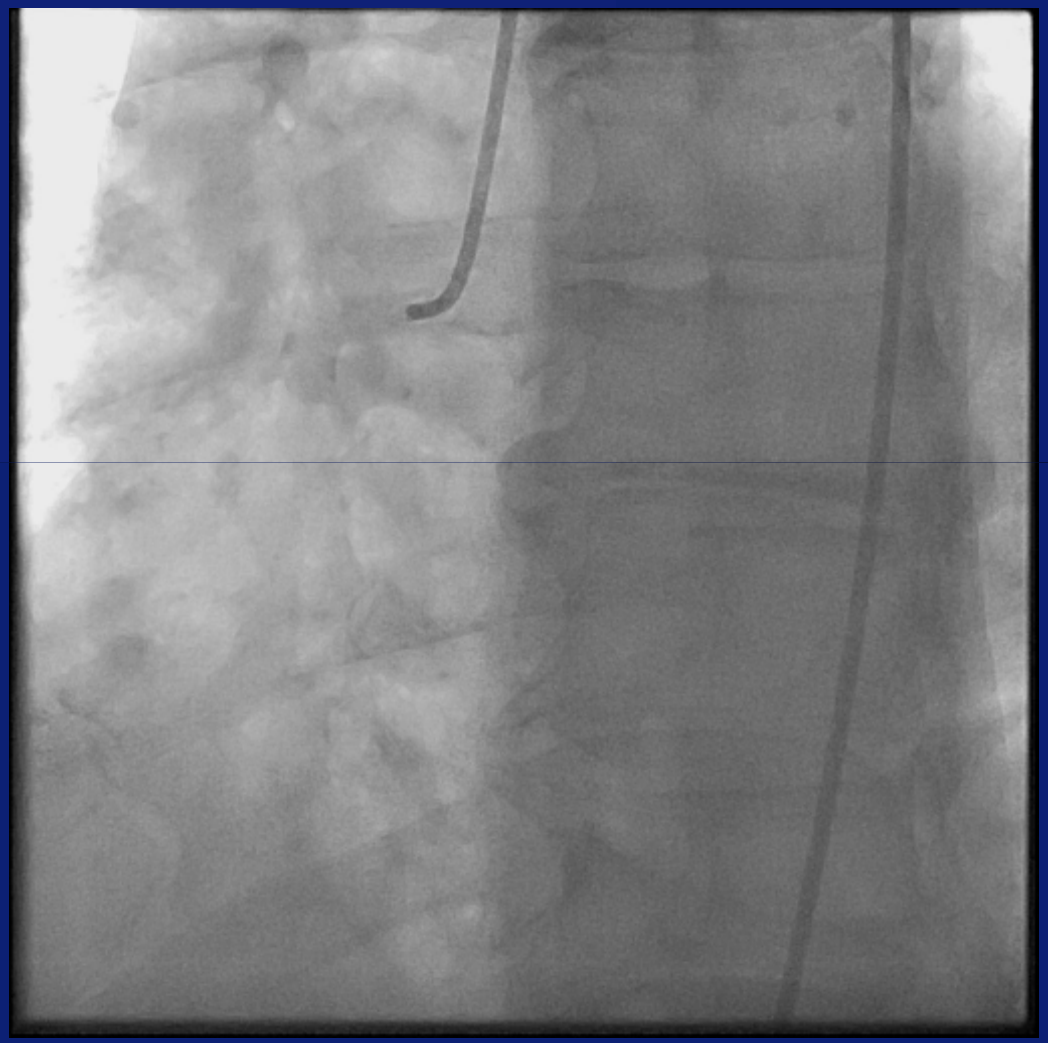
# Patient S:  Cor angio



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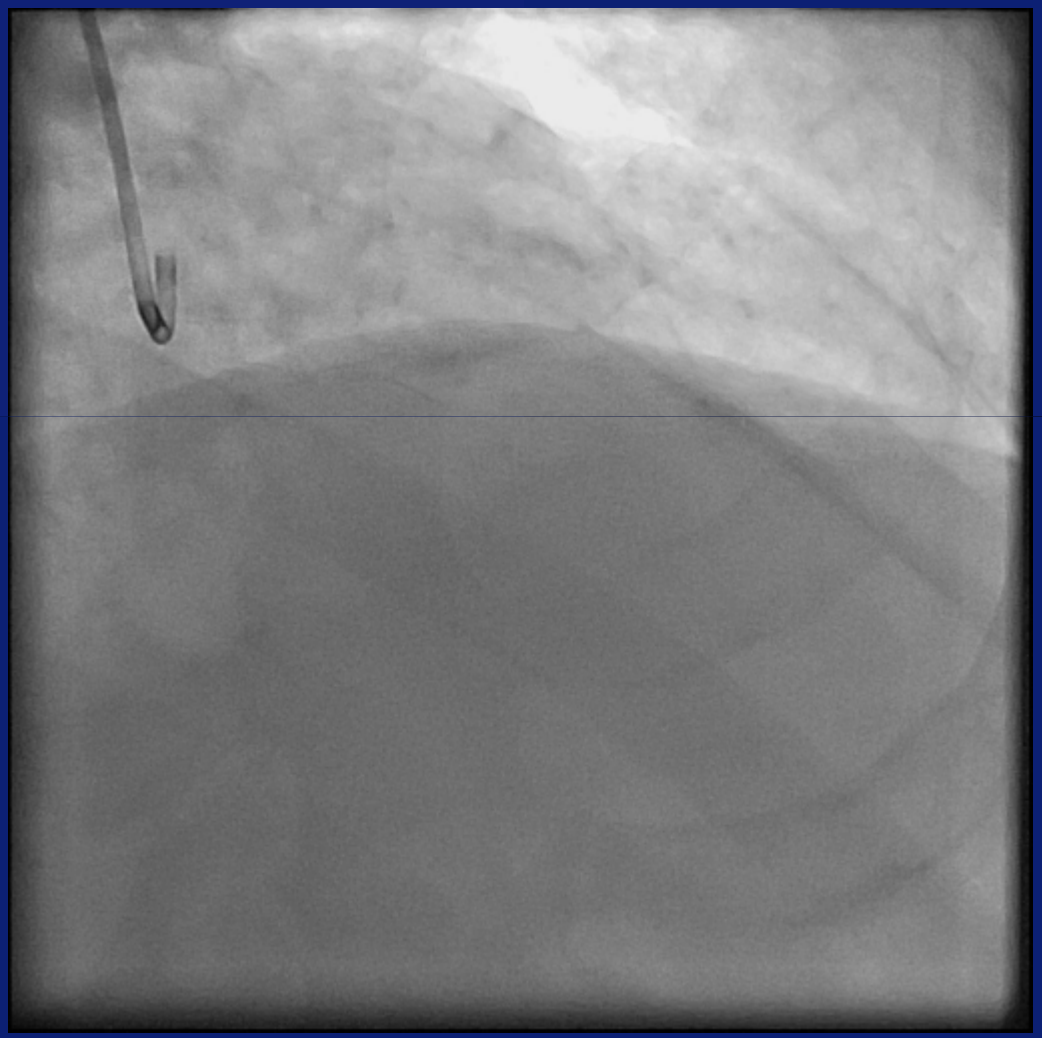

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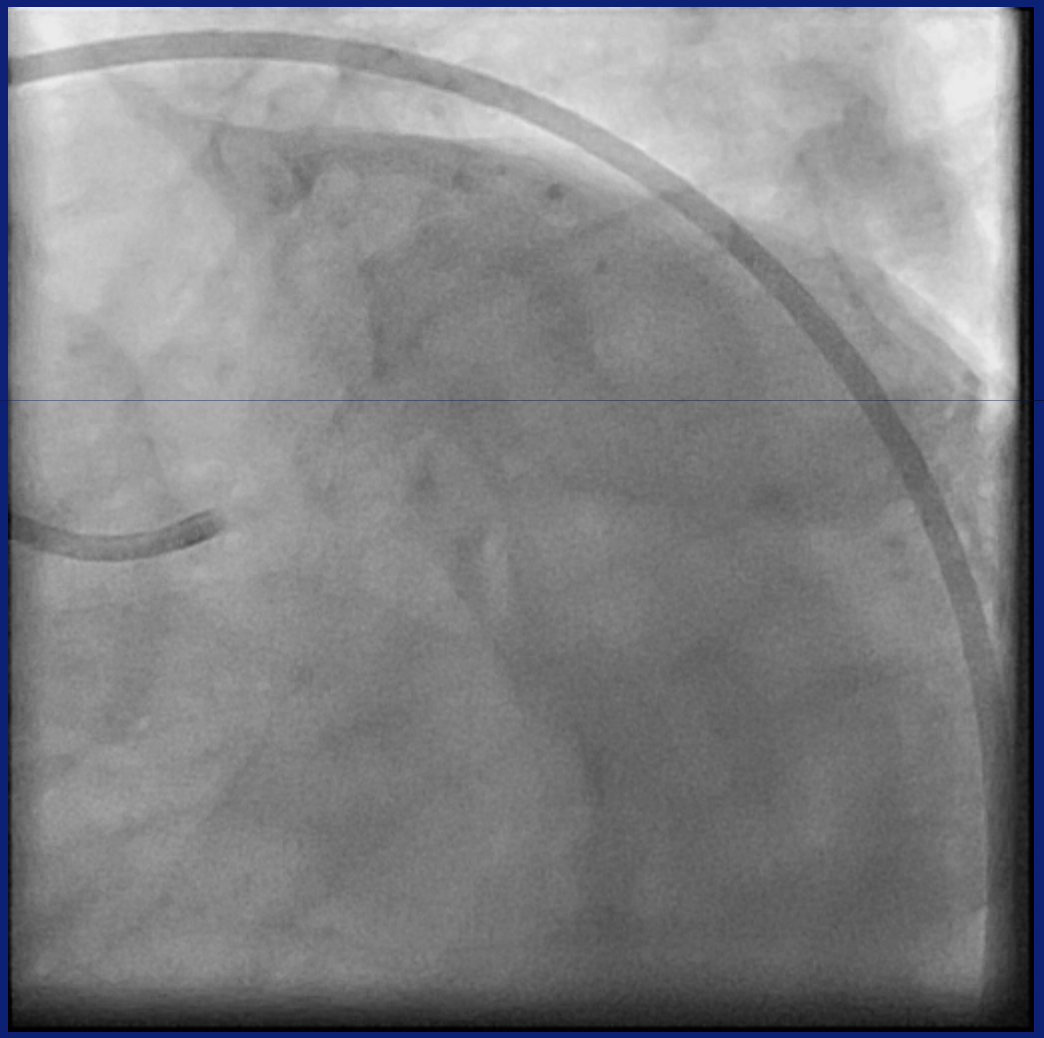

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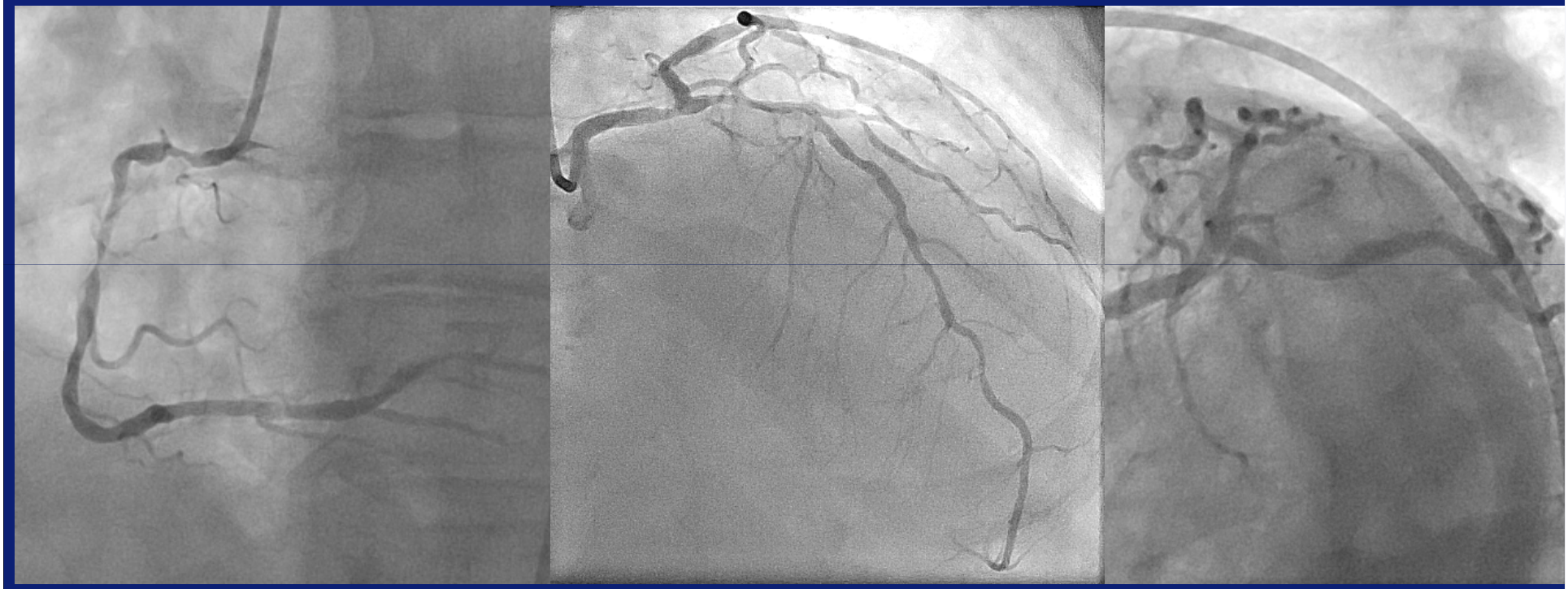

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# What next?

1) emergency CABG

2) primary PCI

3) IABP: try to settle symptoms down for semi-urgent revascularization

Q5

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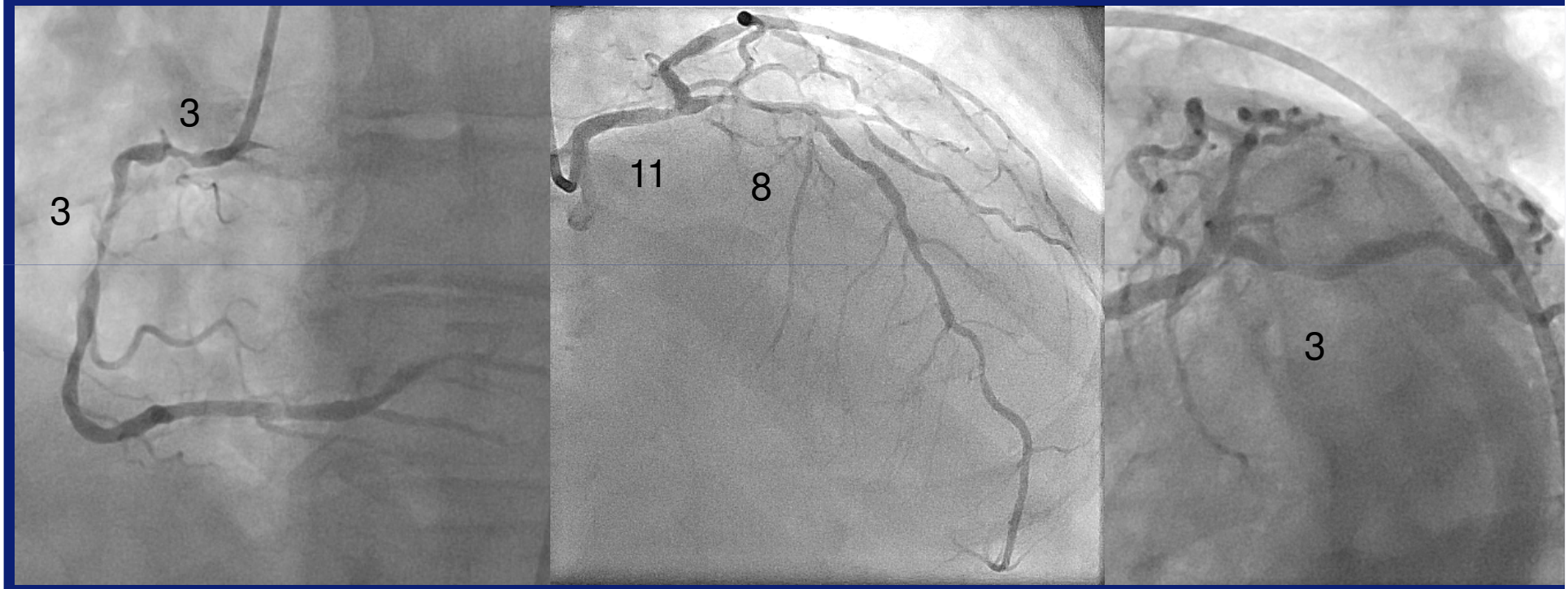
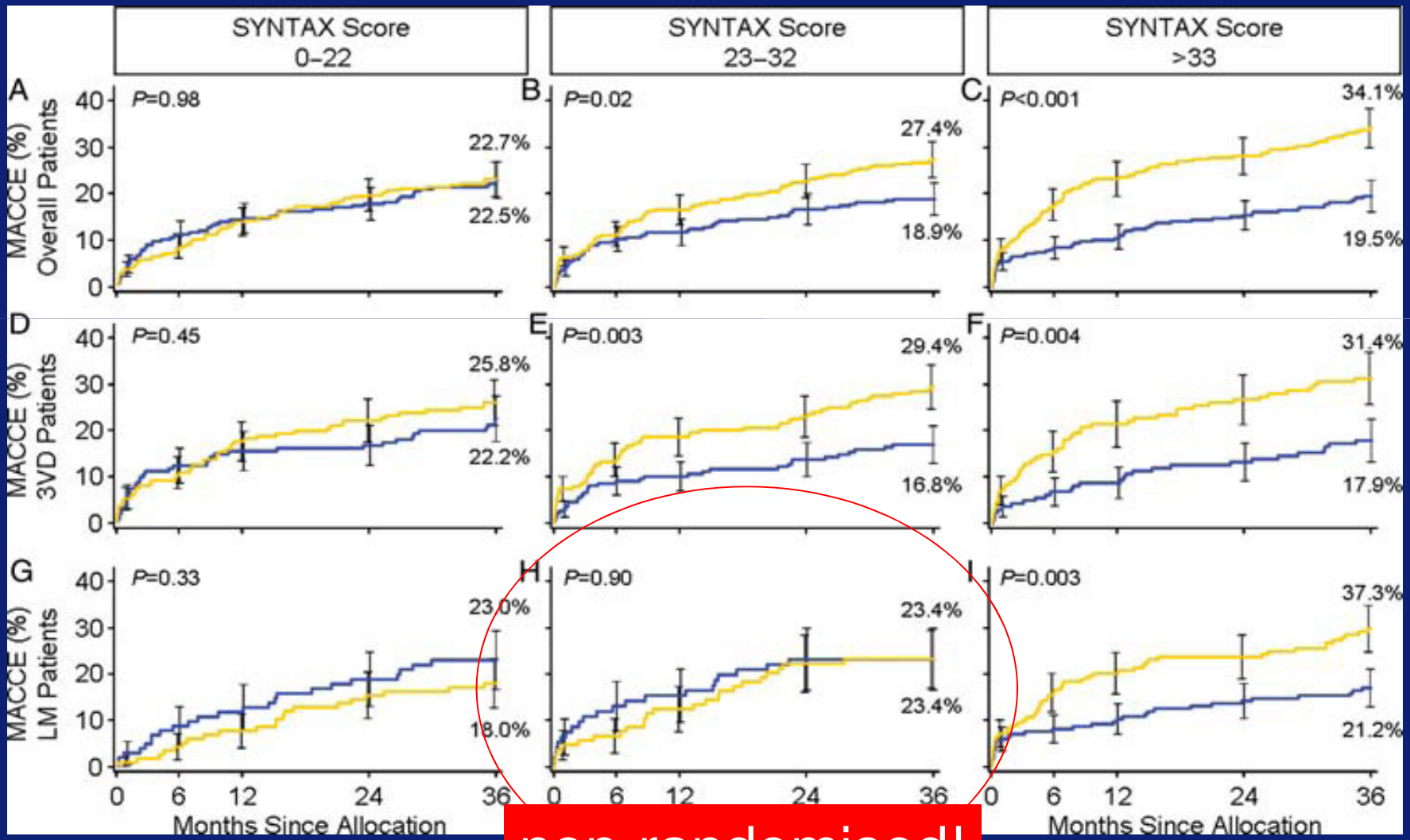
# Patient S: Syntax score




Total=29

# Syntax trial: Left main disease subset




non-randomised!

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# Patient S

- The surgeon will not be able to operate for at least 4 hours, possibly longer
- Persistent pain, score 9/10 despite IV nitrates, fentanyl 75mg and an IABP.
- ECG: pan-ischaemia persists
- Haemodynamically stable at this point
- Heart team consensus:  PCI everything

# Patient S: Management

- IABP (placed while waiting for the surgeon)
- GpIIbIIIa (On-going ischaemia, high risk PCI)
- Strategy: PCI RCA then re-evaluate timing of PCI of the left sided lesions

# ESC Guidelines in this situation

**Recommendations for GP IIb/IIIa receptor inhibitors**

| Recommendations | Class [a] | Level [b] | Ref [c] |
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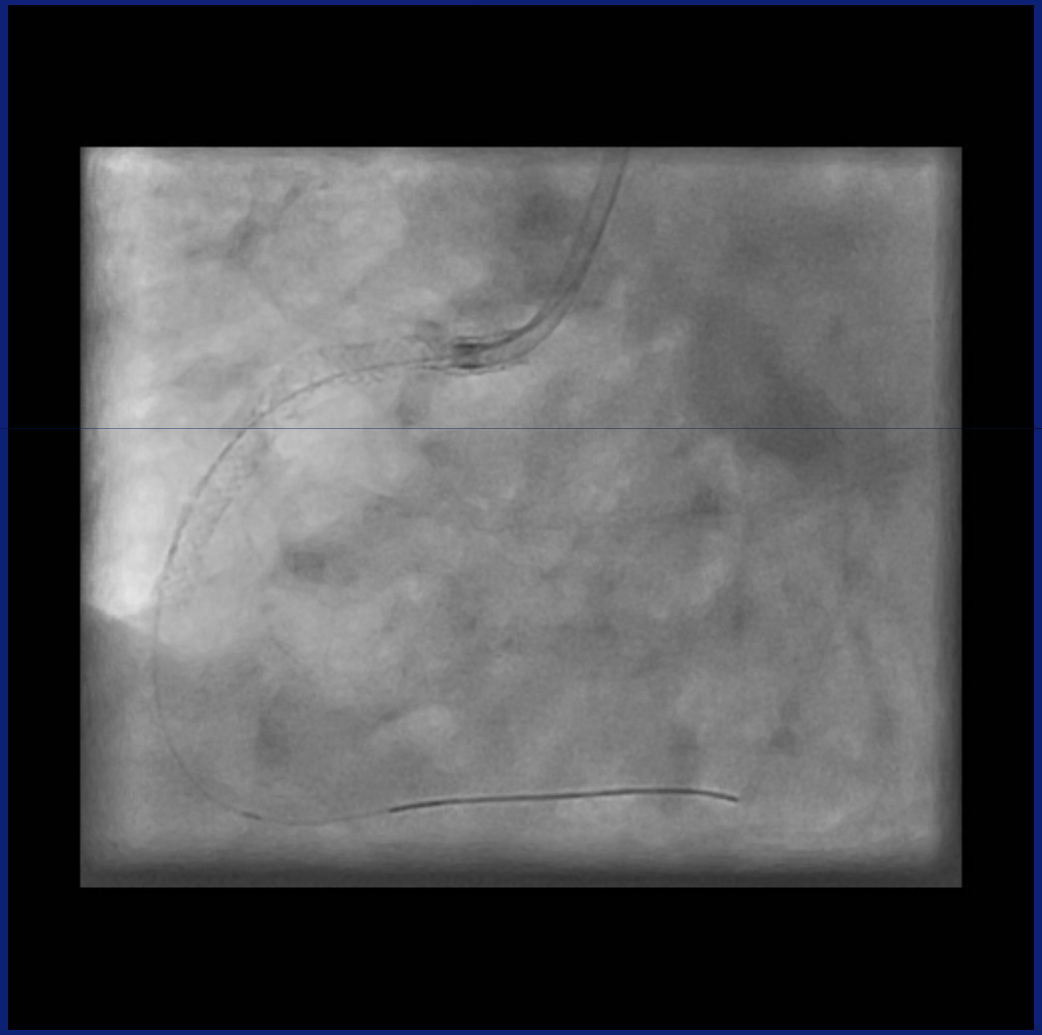
# Patient S: PCI RCA



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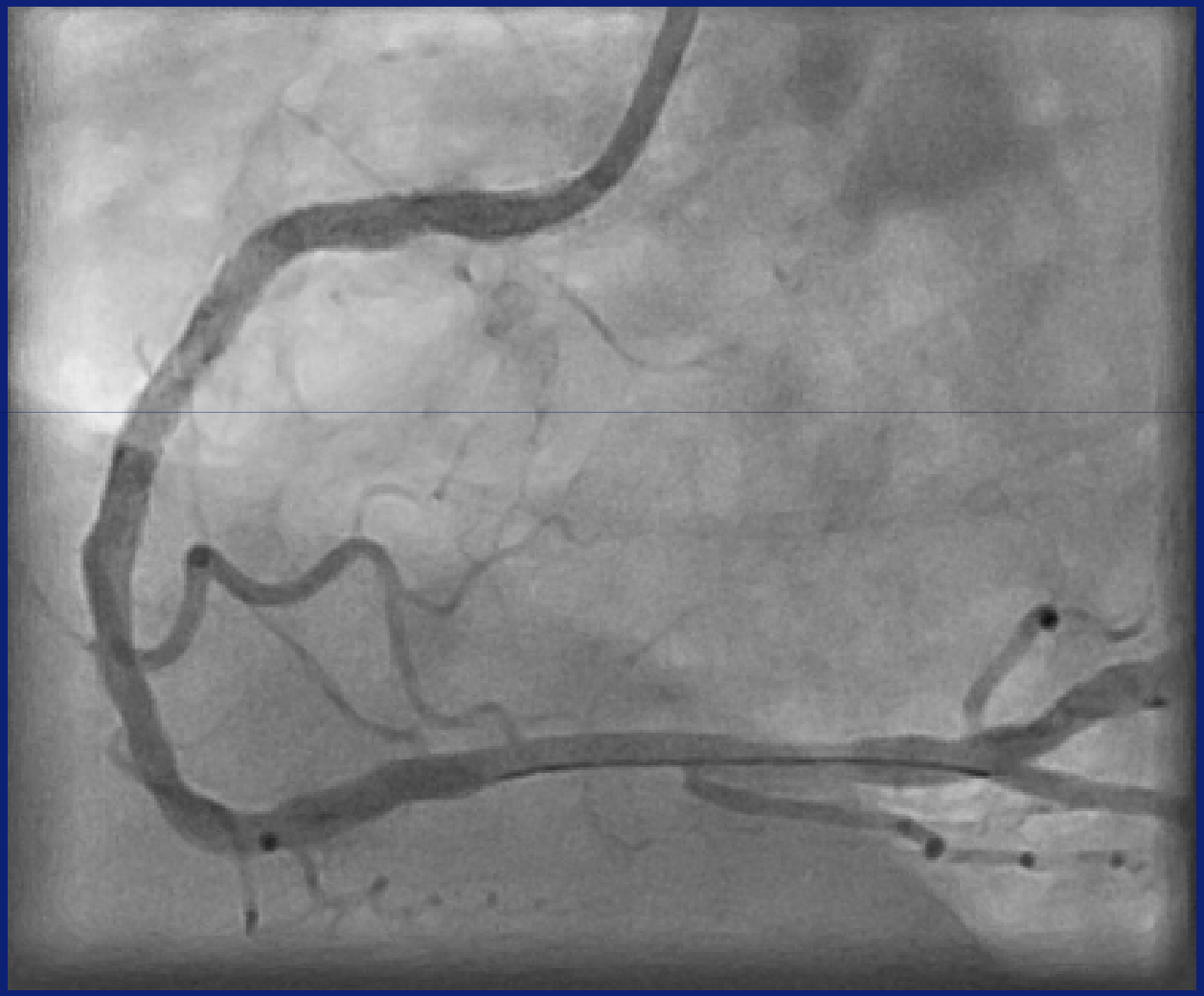
# Patient S: PCI RCA



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# Patient S

- Pain score has dropped from 9/10 to 4/10
- ECG monitoring shows a reduction but not complete resolution of ST-depression
- Haemodynamically completely stable
- Pt is having backpain, feels distraught at the prospect of lying flat on his back for 24 hours with a IABP in situ
- Decision:  to proceed with complete revascularisation

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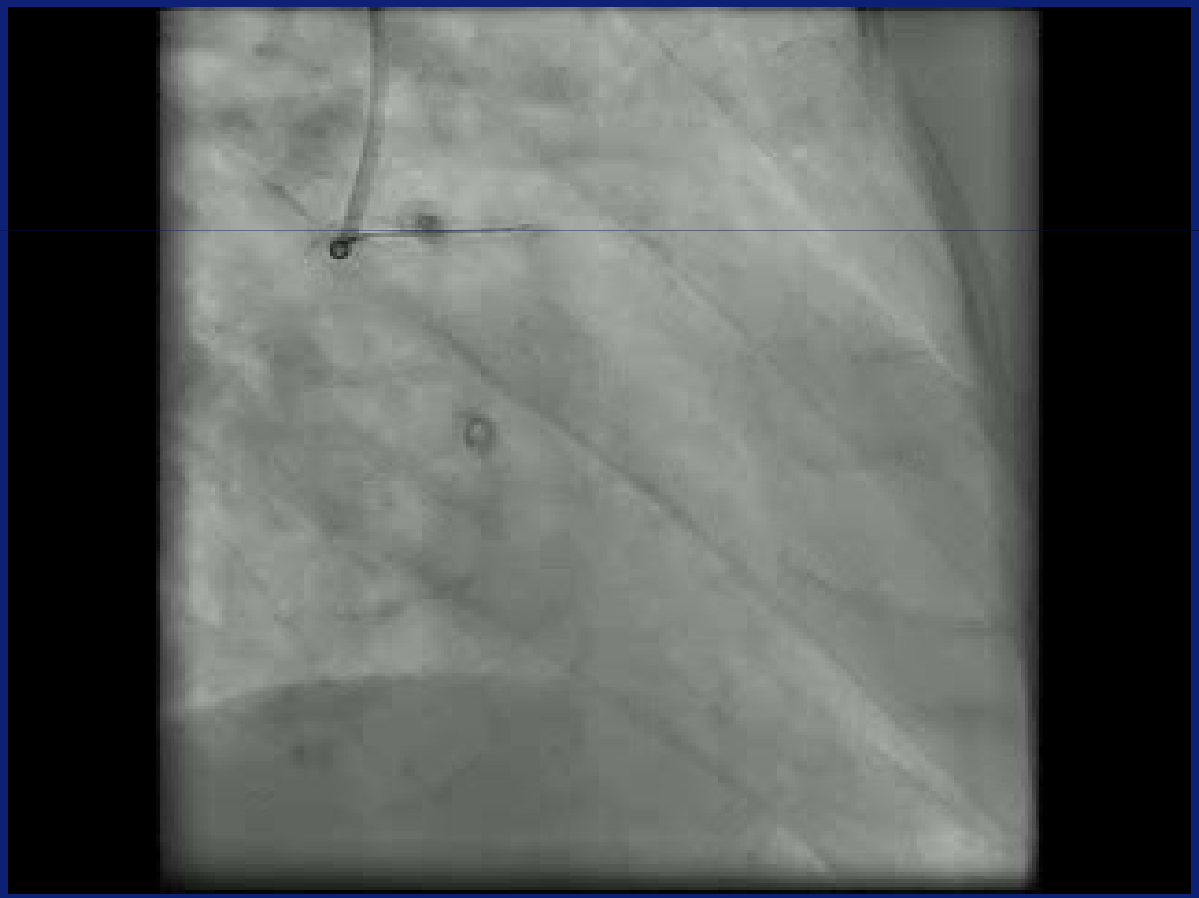
# Patient S

PCI LAD, LCX, LMS; final result:



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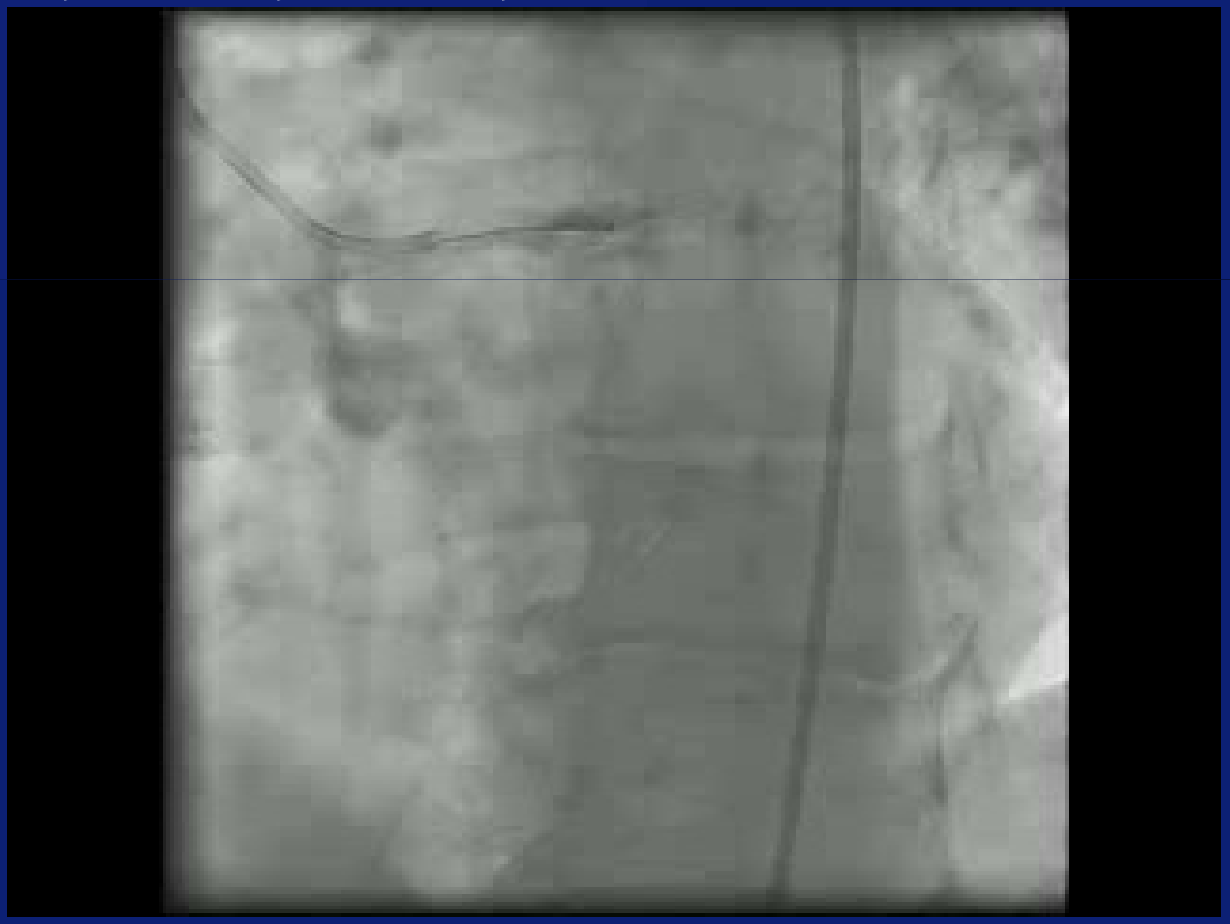

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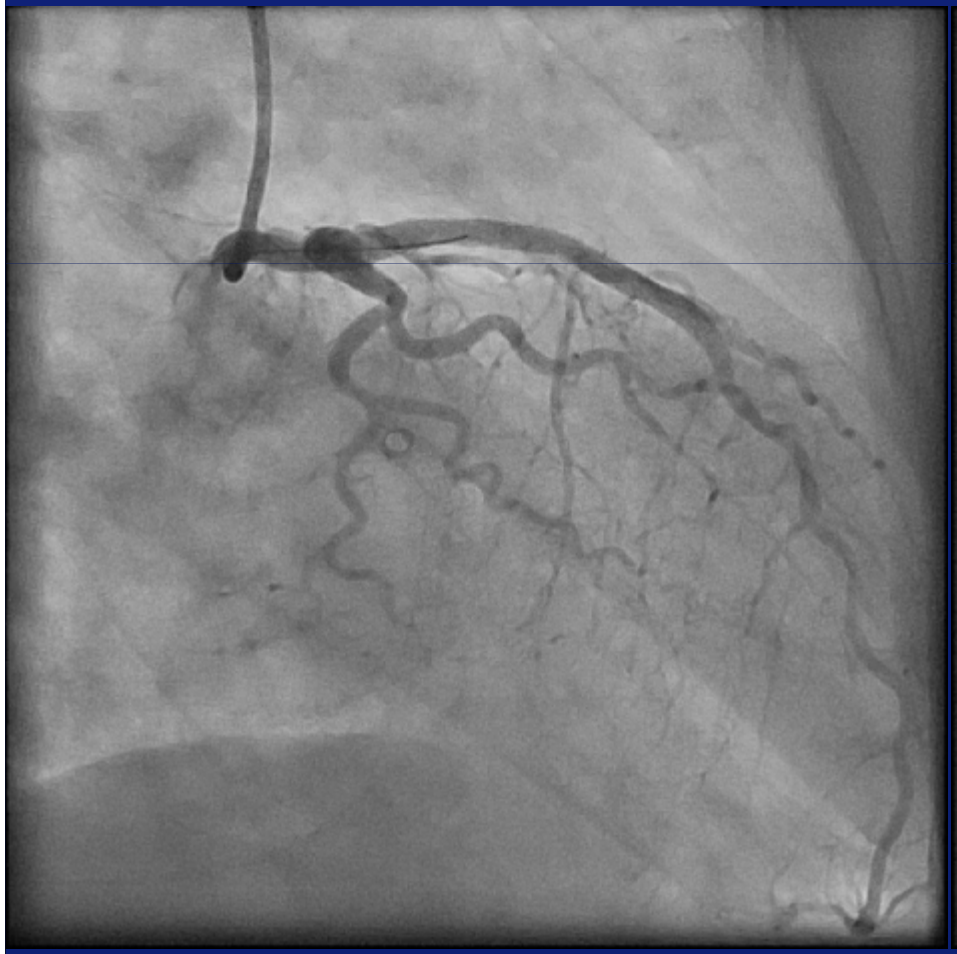

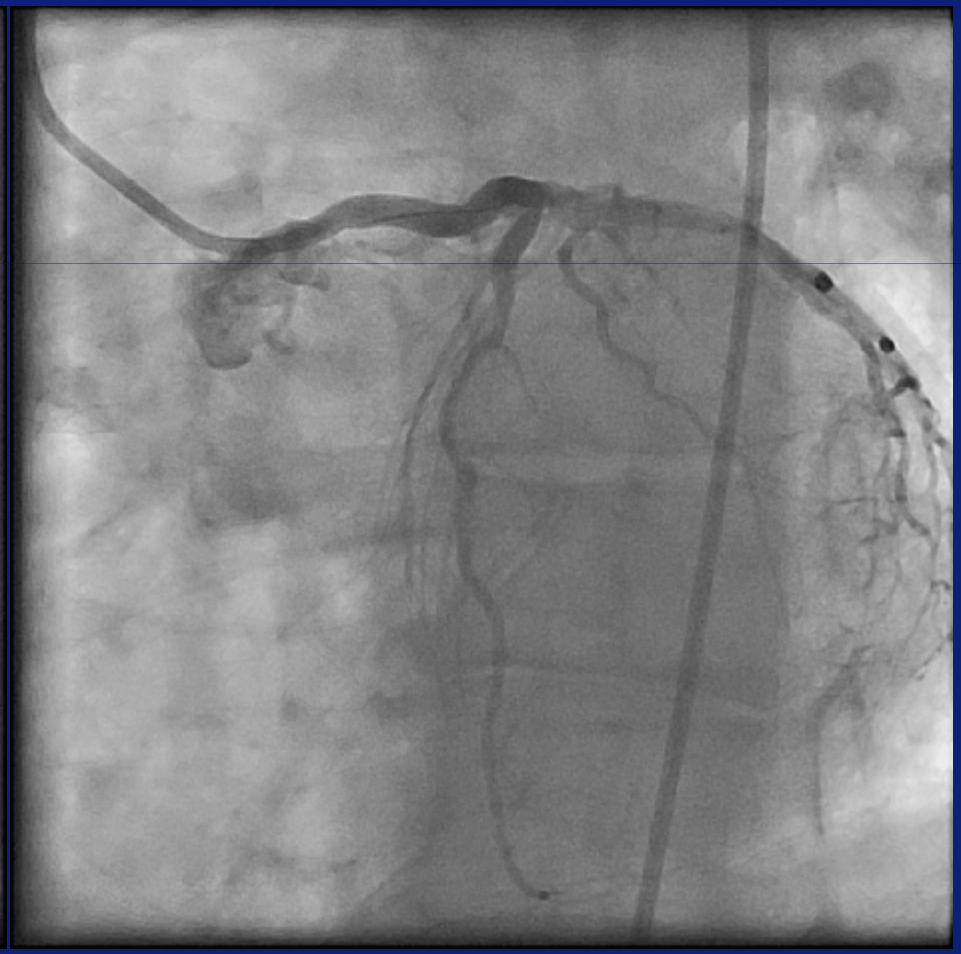

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# Patient S

- Chest pain resolved
- Serial cardiac enzymes:
  - HsTroponin 165ng/l
  - CkMb 5ug/l (upper limit:  7.5 )
- Creatinine stable
- No bleeding event

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# Conclusions

- The choice of combination of antiplatelet agents (oral, IV) depends on the balance of risk of ischaemic and bleeding events
- In high-risk patients eptifibatide or tirofiban may be considered prior to early angiography in addition to DAPT, if there is ongoing ischaemia and the risk of bleeding is low.
- Among patients who are already treated with DAPT, the addition of a GP IIb/IIIa receptor inhibitor for high-risk PCI (elevated troponin, visible thrombus) is recommended if the risk of bleeding is low.