

Diabetes & Coronary Revascularisation ESC Guidelines - Clinical Cases

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ESC Guidelines

Overall Statement for Revascularization in Diabetics

Consequently, overall current evidence continues to favour CABG as the revascularization modality of choice for patients with diabetes and multivessel disease. When patients present with a comorbidity that increases surgical risk, the choice of revascularization method is best decided by multidisciplinary individualized risk assessment.

Aspects to be considered by the Heart Team

| PCI | CABG |
|---|---|
| <p style="text-align: center;">FAVOURS PCI</p> <p>Clinical characteristics Presence of severe co-morbidity (not adequately reflected by scores) Advanced age/frailty/reduced life expectancy Restricted mobility and conditions that affect the rehabilitation process</p> <p>Anatomical and technical aspects MVD with SYNTAX score 0-22 Anatomy likely resulting in incomplete revascularization with CABG due to poor quality or missing conduits Severe chest deformation or scoliosis Sequelae of chest radiation Porcelain aorta^a</p> | <p style="text-align: center;">FAVOURS CABG</p> <p>Clinical characteristics Diabetes Reduced LV function (EF \leq35%) Contraindication to DAPT Recurrent diffuse in-stent restenosis</p> <p>Anatomical and technical aspects MVD with SYNTAX score \geq23 Anatomy likely resulting in incomplete revascularization with PCI Severely calcified coronary artery lesions limiting lesion expansion</p> <p>Need for concomitant interventions Ascending aortic pathology with indication for surgery Concomitant cardiac surgery</p> |

CABG = coronary artery bypass grafting; Cx = circumflex; DAPT = dual antiplatelet therapy; EF = ejection fraction; LAD = left anterior descending coronary artery; LIMA = left internal mammary artery; LV = left ventricular; MVD = multivessel coronary artery disease; PCI = percutaneous coronary intervention; PDA = posterior descending artery; RA = radial artery; RIMA = right internal mammary artery; SYNTAX = Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery.

^aConsider no-touch off-pump CABG in case of porcelain aorta.

Key Messages in Guidelines

Diabetes

20 Key messages

- (1) Myocardial revascularization is performed for the relief of symptoms of myocardial ischaemia and the improvement of prognosis. In SCAD, the prognostic benefit is dependent on the extent of myocardium subject to ischaemia.
- (2) The prognostic and symptomatic benefits of myocardial revascularization critically depend on the completeness of revascularization. Therefore, the ability to achieve complete revascularization is a key issue when choosing the appropriate treatment strategy.
- (3) Apart from issues of individual operative risk and technical feasibility, **diabetes mellitus** and the anatomical complexity of CAD determine the relative benefits of PCI and CABG.
- (4) The SYNTAX score is the recommended tool to gauge the anatomical complexity of coronary disease.

Recommendations for Revascularisation (SCAD)

Diabetes vs No Diabetes

Recommendation for the type of revascularization in patients with stable coronary artery disease with suitable coronary anatomy for both procedures and low predicted surgical mortality^d

| Recommendations according to extent of CAD | CABG | | PCI | |
|---|--------------------|--------------------|--------------------|--------------------|
| | Class ^a | Level ^b | Class ^a | Level ^b |
| Three-vessel CAD without diabetes mellitus | | | | |
| Three-vessel disease with low SYNTAX score (0 - 22). ^{102,105,121,123,124,135,149} | I | A | I | A |
| Three-vessel disease with intermediate or high SYNTAX score (>22). ^{c 102,105,121,123,124,135,149} | I | A | III | A |
| Three-vessel CAD with diabetes mellitus | | | | |
| Three-vessel disease with low SYNTAX score 0–22. ^{102,105,121,123,124,135,150–157} | I | A | IIb | A |
| Three-vessel disease with intermediate or high SYNTAX score (>22). ^{c 102,105,121,123,124,135,150–157} | I | A | III | A |

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SYNTAX score calculation information is available at <http://www.syntaxscore.com>.

CABG = coronary artery bypass grafting; CAD = coronary artery disease; LAD = left anterior descending coronary artery; PCI = percutaneous coronary intervention; SYNTAX = Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery.

^aClass of recommendation.

^bLevel of evidence.

^cPCI should be considered if the Heart Team is concerned about the surgical risk or if the patient refuses CABG after adequate counselling by the Heart Team.

^dFor example, absence of previous cardiac surgery, severe morbidities, frailty, or immobility precluding CABG (also see Table 5).

Changes compared to previous ESC Guidelines

| DOWNGRADES | |
|---|--|
| Distal protection devices for PCI of SVG lesions | |
| Bivalirudin for PCI in NSTEMI-ACS | |
| Bivalirudin for PCI in STEMI | |
| PCI for MVD with diabetes and SYNTAX score <23 | |
| Platelet function testing to guide antiplatelet therapy interruption in patients undergoing cardiac surgery | |
| EuroSCORE II to assess in-hospital mortality after CABG | |

ESC 2014 **ESC 2018**

| | | | |
|--|-----------|--|-----------|
| | Class I | | Class IIa |
| | Class IIb | | Class III |

Scores for Surgical Risk & CAD Complexity

Recommendations on criteria for the choice between coronary artery bypass grafting and percutaneous coronary intervention

| Recommendations | Class ^a | Level ^b |
|--|--------------------|--------------------|
| Assessment of surgical risk^c | | |
| It is recommended that the STS score is calculated to assess in-hospital or 30 day mortality, and in-hospital morbidity after CABG. ^{112,114,138} | I | B |
| Calculation of the EuroSCORE II score may be considered to assess in-hospital mortality after CABG. ¹¹² | IIb | B |
| Assessment of CAD complexity | | |
| In patients with LM or multivessel disease, it is recommended that the SYNTAX score is calculated to assess the anatomical complexity of CAD and the long-term risk of mortality and morbidity after PCI. ^{117–124} | I | B |
| When considering the decision between CABG and PCI, completeness of revascularization should be prioritized. ^{131,132,134–136} | IIa | B |

EuroSCORE = European System for Cardiac Operative Risk Evaluation; CABG = coronary artery bypass grafting; CAD = coronary artery disease; LM = left main; PCI = percutaneous coronary intervention; STS = Society of Thoracic Surgeons; SYNTAX = Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery.

^aClass of recommendation.

^bLevel of evidence.

^cLevel of evidence refers to prediction of outcomes.

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How much is low predicted surgical mortality ?

There are no established cut-offs for low predicted surgical mortality based on the EuroSCORE II or STS score. Thus, individualized treatment decisions are needed. These decisions should respect the range of predicted surgical risks in the major RCTs that inform the choice of revascularization modality (Table 5). In these studies, the predicted surgical risk was assessed by the logistic EuroSCORE. Compared with the more recent EuroSCORE II, the logistic EuroSCORE has similar discrimination but poorer calibration and, thus, overestimates surgical mortality by roughly two-fold.¹¹⁵

Table 5 Logistic EuroSCOREs in major randomized trials comparing percutaneous coronary intervention with coronary artery bypass grafting

| Trial | EuroSCORE PCI | EuroSCORE CABG |
|-----------|---------------|----------------|
| SYNTAX | 3.8 ± 2.6 | 3.8 ± 2.7 |
| BEST | 2.9 ± 2.0 | 3.0 ± 2.1 |
| FREEDOM | 2.7 ± 2.4 | 2.8 ± 2.5 |
| PRECOMBAT | 2.7 ± 1.8 | 2.8 ± 1.9 |
| EXCEL | Not reported | Not reported |
| NOBLE | 2 (2–4) | 2 (2–4) |

Numbers are presented as mean ± SD or median (interquartile range).
 BEST = Randomised Comparison of Coronary Artery Bypass Surgery and Everolimus-Eluting Stent Implantation in the Treatment of Patients with Multivessel Coronary Artery Disease; CABG = coronary artery bypass grafting; EuroSCORE = European System for Cardiac Operative Risk Evaluation; EXCEL = Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization; NOBLE = Nordic-Baltic-British Left Main Revascularization Study; PCI = percutaneous coronary intervention; PRECOMBAT = Premier of Randomised Comparison of Bypass Surgery versus Angioplasty Using Sirolimus-Eluting Stent in Patients with Left Main Coronary Artery Disease; SYNTAX = Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery.

Recommendations for Revascularization Strategy in NSTEMI

Recommendations for invasive evaluation and revascularization in non-ST-elevation acute coronary syndrome

| Recommendations | Class ^a | Level ^b |
|---|--------------------|--------------------|
| It is recommended to base the revascularization strategy (<i>ad hoc</i> culprit lesion PCI/multivessel PCI/CABG) on the clinical status and comorbidities, as well as the disease severity [i.e. the distribution and angiographic lesion characteristics (e.g. SYNTAX score)], according to the principles for SCAD. ^{c 194} | I | B |

Recommendations for Revascularization Strategy in **STEMI**

Primary percutaneous coronary intervention for myocardial reperfusion in ST-elevation myocardial infarction: procedural aspects (strategy and technique)

| Recommendations | Class ^a | Level ^b |
|---|--------------------|--------------------|
| Strategy | | |
| 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 |

Case #1

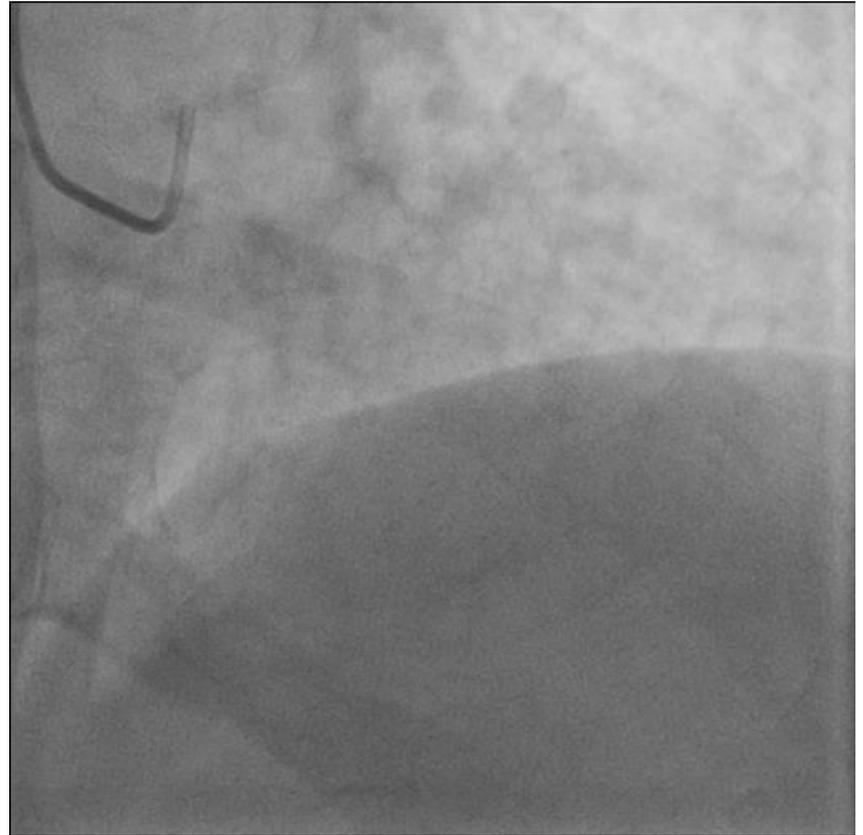
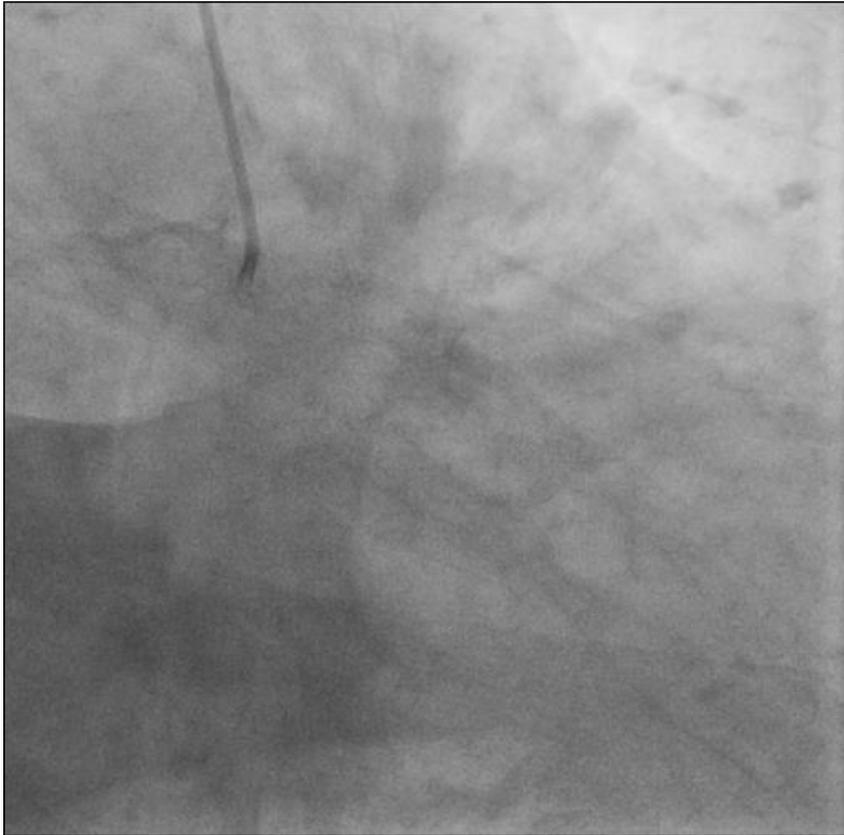
Case #1 – Clinical Data

- **69-yr old Male patient**
- **Medical History**
 - Diabetes, Hypertension, Dyslipidaemia
- **Clinical Presentation**

Stable coronary artery disease
- **Echocardiogram: EF 40-45%**

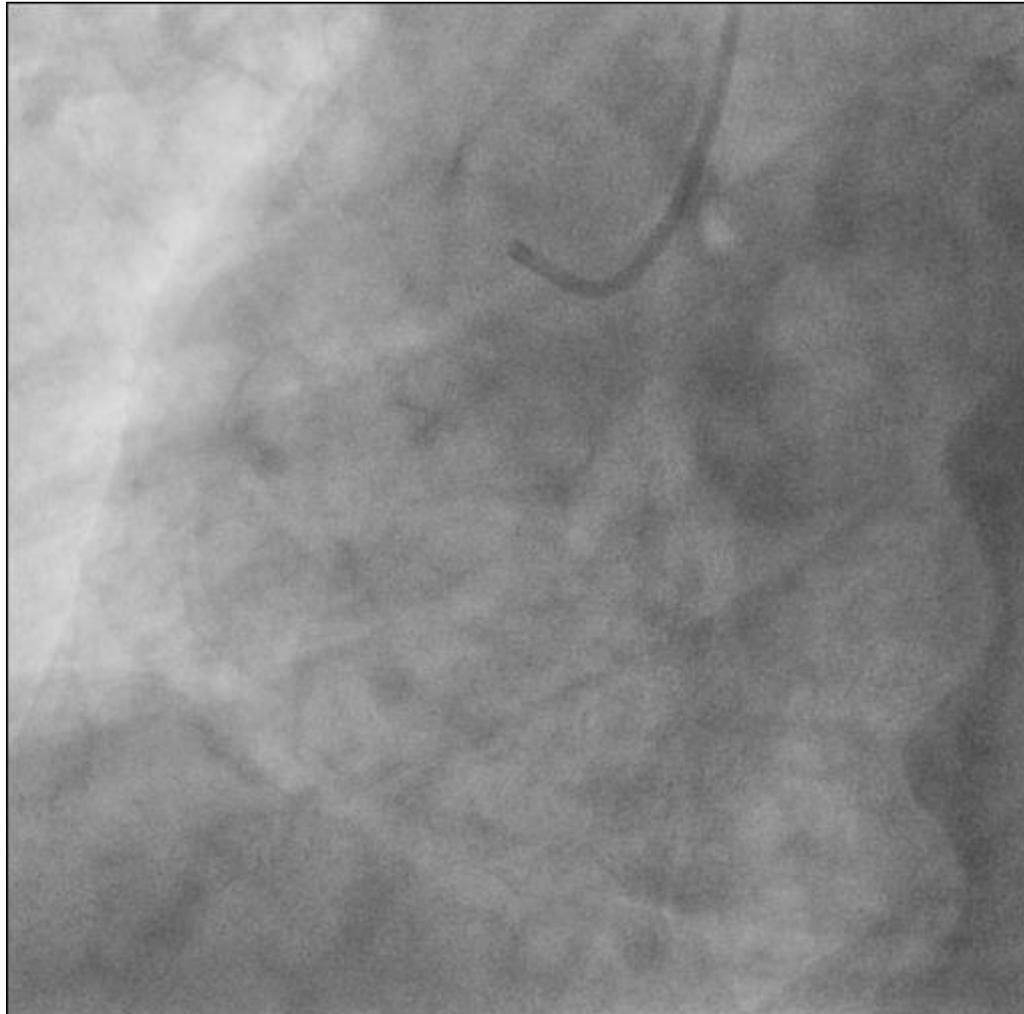
Case #1 – LCA Angiogram

Severe LAD/Diagonal disease and non-significant LCx disease



Case #1 – RCA Angiogram

Subtotal RCA occlusion



SYNTAX score

Intermediate Syntax score I

CARDIOLYSIS Boston Scientific

For reliable results, please do not use your browsers back button - Calculator version 2.28

SYNTAX Score I

Lesion 1

| | |
|---------------------------------|-----------|
| (segment 6): 3.5x2= | 7 |
| (segment 7): 2.5x2= | 5 |
| (segment 9): 1x2= | 2 |
| Bifurcation Type: Medina 1,1,1: | 2 |
| Angulation <70° | 1 |
| Length >20 mm | 1 |
| Heavy calcification | 2 |
| <i>Sub total lesion 1</i> | <i>20</i> |

Lesion 2

| | |
|---------------------------|----------|
| (segment 2): 1x2= | 2 |
| (segment 3): 1x2= | 2 |
| Length >20 mm | 1 |
| Heavy calcification | 2 |
| <i>Sub total lesion 2</i> | <i>7</i> |

TOTAL: 27

SYNTAX score II

To combine clinical and anatomical risk estimation, the SYNTAX II score was retrospectively derived from the SYNTAX cohort¹²⁷ and subsequently externally validated.^{120,128,129} Nevertheless, compared with the SYNTAX score, its value in assigning patients to PCI or CABG is less well investigated. The fact that the SYNTAX II score failed to predict the outcome of the EXCEL trial raises additional concern.¹³⁰

SYNTAX score II

SYNTAX Score II questions

SYNTAX Score II



SYNTAX Score I i

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

Age (years) i

PCI
 SYNTAX Score II: 37.8
 PCI 4 Year Mortality: 12.7 %

CrCl i mL/min

CABG
 SYNTAX Score II: 31.0
 CABG 4 Year Mortality: 7.4 %

LVEF (%) i

Treatment recommendation i: CABG

Left Main i no yes

Information
 Treatment recommendation is made on statistical comparison of mortality predictions.

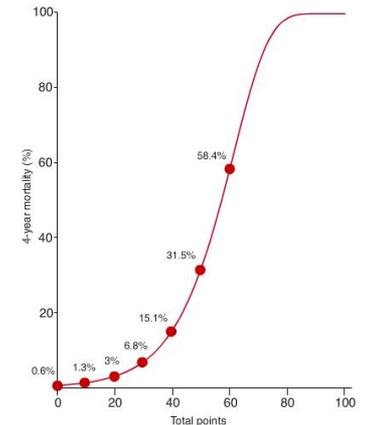
Gender male female

COPD i no yes

PVD i no yes

SYNTAX Score II

Scores: 27
 SYNTAX SCORE II 4-year mortality



STS score

STS Adult Cardiac Surgery Database Version 2.9

RISK SCORES

Procedure: Isolated CAB

CALCULATE

Risk of Mortality: 1.294%

Renal Failure: 1.513%

Permanent Stroke: 1.125%

Prolonged Ventilation: 4.577%

DSW Infection: 0.140%

Reoperation: 1.856%

Morbidity or Mortality: 7.865%

Short Length of Stay: 54.165%

Long Length of Stay: 3.066%

PRINT

CLEAR

Details of Selected Field:

Status

Indicate the clinical status of the patient prior to entering the operating room.

Euroscore II



Patient related factors

| | |
|---|-------------------------------------|
| Age | <input type="text" value="69"/> |
| Gender | <input type="radio"/> Male |
| Chronic pulmonary disease | <input type="checkbox"/> No |
| Extracardiac arteriopathy | <input type="checkbox"/> No |
| Poor mobility | <input type="checkbox"/> No |
| Previous Cardiac Surgery | <input type="checkbox"/> No |
| Active endocarditis | <input type="checkbox"/> No |
| Critical preoperative state | <input type="checkbox"/> No |
| Renal impairment | <input type="text" value="normal"/> |
| <input type="button" value="Creatinine Clearance"/> | |
| Diabetes on insulin | <input type="checkbox"/> No |

Cardiac related factors

| | |
|------------------------|-------------------------------------|
| Engina CCS Class IV | <input type="checkbox"/> No |
| LV function | <input type="text" value="modera"/> |
| Recent MI | <input type="checkbox"/> No |
| Pulmonary hypertension | <input type="checkbox"/> No |
| NYHA | <input type="text" value="I"/> |

Operation related factors

| | |
|---------------------------|---------------------------------------|
| Surgery on thoracic aorta | <input type="checkbox"/> No |
| Urgency | <input type="text" value="elective"/> |
| Weight of the operation | <input type="text" value="isolated"/> |

EuroSCORE II

0.88 %

Based on the information you have provided... if 100 similar patients, had an operation, **0.88** may be expect to die, whereas **99.12** would be expected to survive. Your EuroSCORE is **0.88**.



Euroscore I

For comparison purposes to Trials

| Patient related factors | |
|-----------------------------|---------------------------------|
| Age | <input type="text" value="69"/> |
| Gender | <input type="radio"/> Male |
| Chronic pulmonary disease | <input type="checkbox"/> No |
| Extracardiac arteriopathy | <input type="checkbox"/> No |
| Poor mobility | <input type="checkbox"/> No |
| Previous Cardiac Surgery | <input type="checkbox"/> No |
| Creatinine | <input type="checkbox"/> No |
| Active endocarditis | <input type="checkbox"/> No |
| Critical preoperative state | <input type="checkbox"/> No |

| Cardiac related factors | |
|-------------------------|-------------------------------------|
| Engina CCS Class IV | <input type="checkbox"/> No |
| LV function | <input type="text" value="modera"/> |
| Recent MI | <input type="checkbox"/> No |
| Pulmonary hypertension | <input type="checkbox"/> No |

| Operation related factors | |
|-----------------------------|-----------------------------|
| Emergency | <input type="checkbox"/> No |
| Other than isolated CABG | <input type="checkbox"/> No |
| Surgery on thoracic aorta | <input type="checkbox"/> No |
| Post infarct septal rupture | <input type="checkbox"/> No |

| EuroSCORE I | |
|---|---------------------------------------|
| 2.40 % | |
| Based on the information you have provided... if 100 similar patients, had an operation, 2.40 may be expect to die, whereas 97.60 would be expected to survive. Your EuroSCORE is 2.40 . | |
| <input type="button" value="reset"/> | <input type="button" value="cancel"/> |

Heart Team & Patient Information

Heart Team

Recommendation for CABG

4 Process for decision-making and patient information

4.1 Patient information and informed consent

Informed consent requires transparency, especially if there is debate over various treatment options. Active patient participation in the decision-making process should be encouraged. Patient information needs to be unbiased, evidence-based, up-to-date, reliable, accessible, relevant, and consistent with legal requirements. Use of terminology

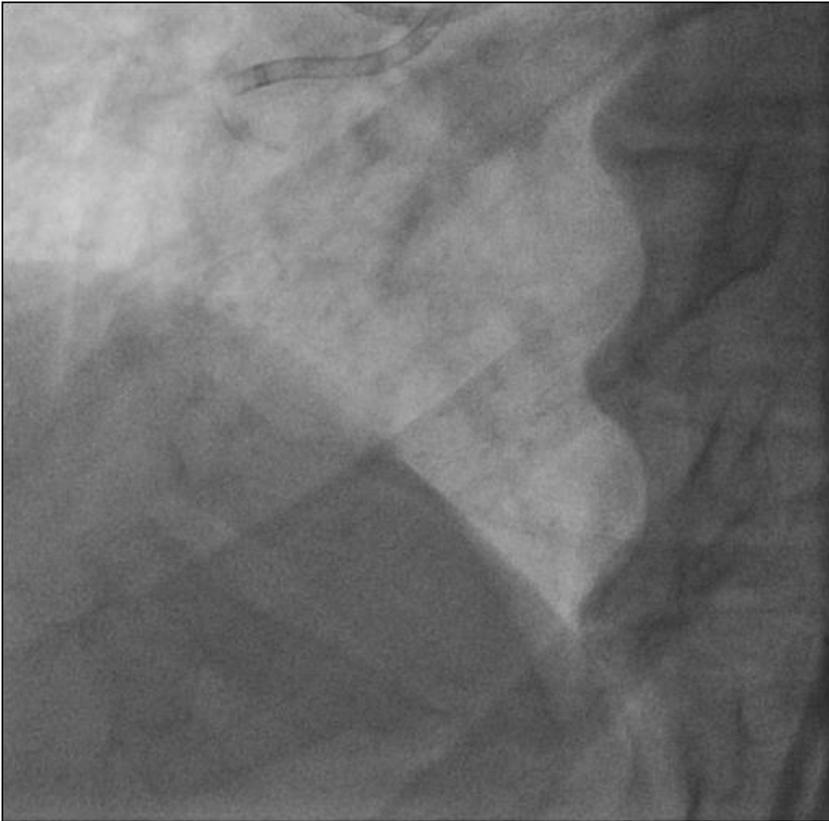
the constraints of an urgent or emergent situation (*Table 3*). The patient's right to decline the treatment option recommended by the Heart Team has to be respected. Patient refusal of a recommended treatment should be acknowledged in a written document after the patient has received the necessary information by the Heart Team members. In this case, the patient may be offered an alternative treatment option by the Heart Team.

Patient Preference: Declined CABG

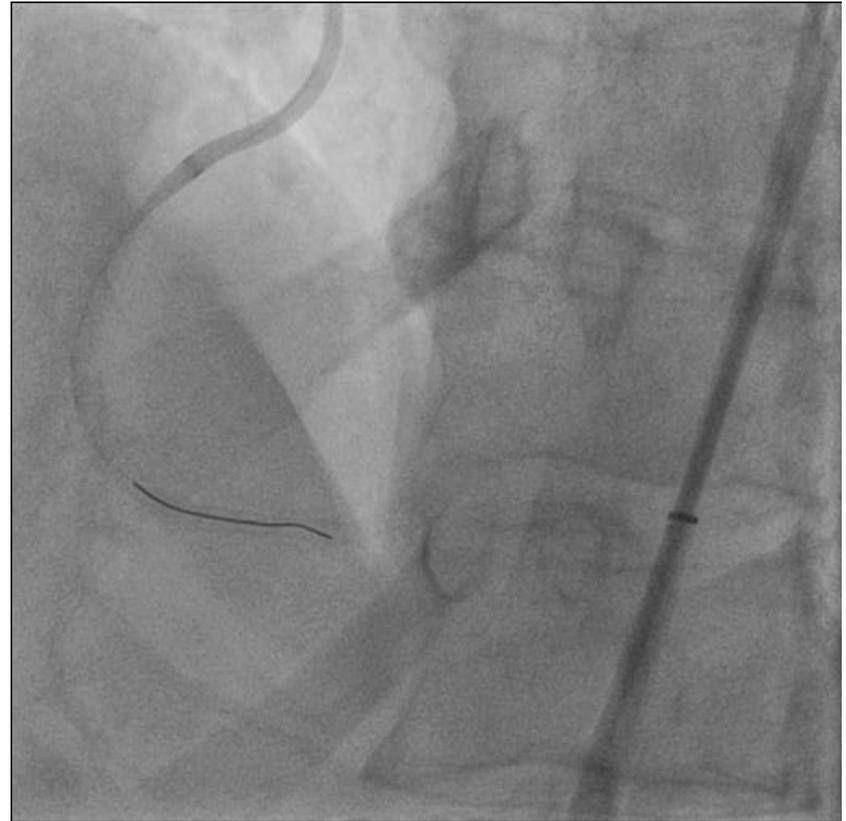
Decision for PCI

PCI RCA

Pre-PCI

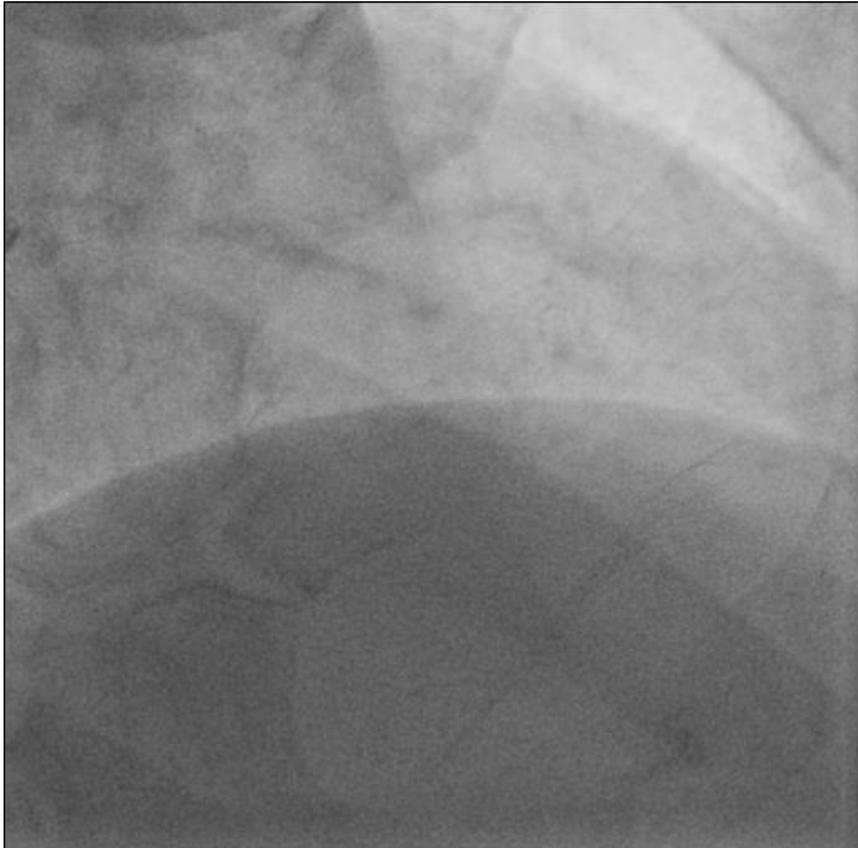


PCI result

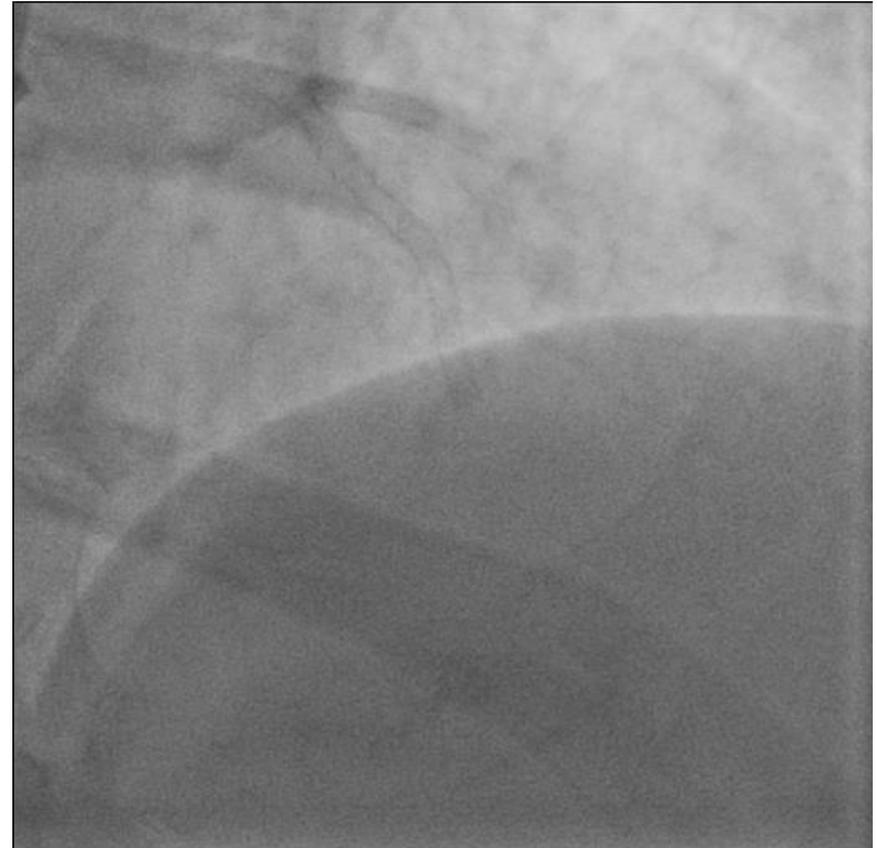


Staged PCI LAD

Pre-PCI



PCI result



Case #2

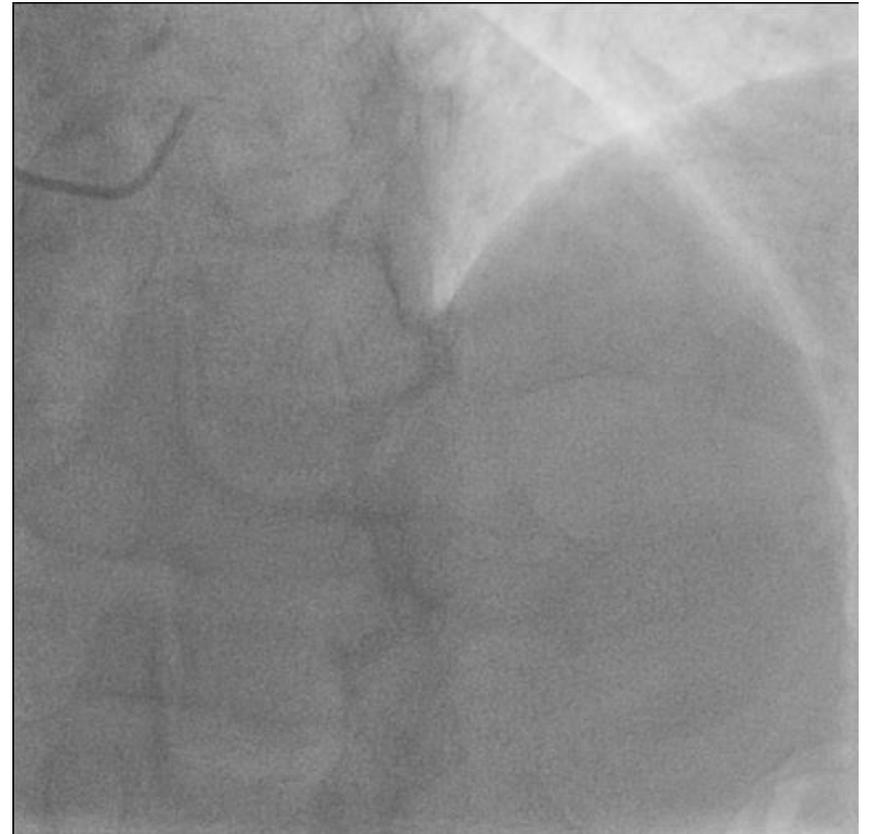
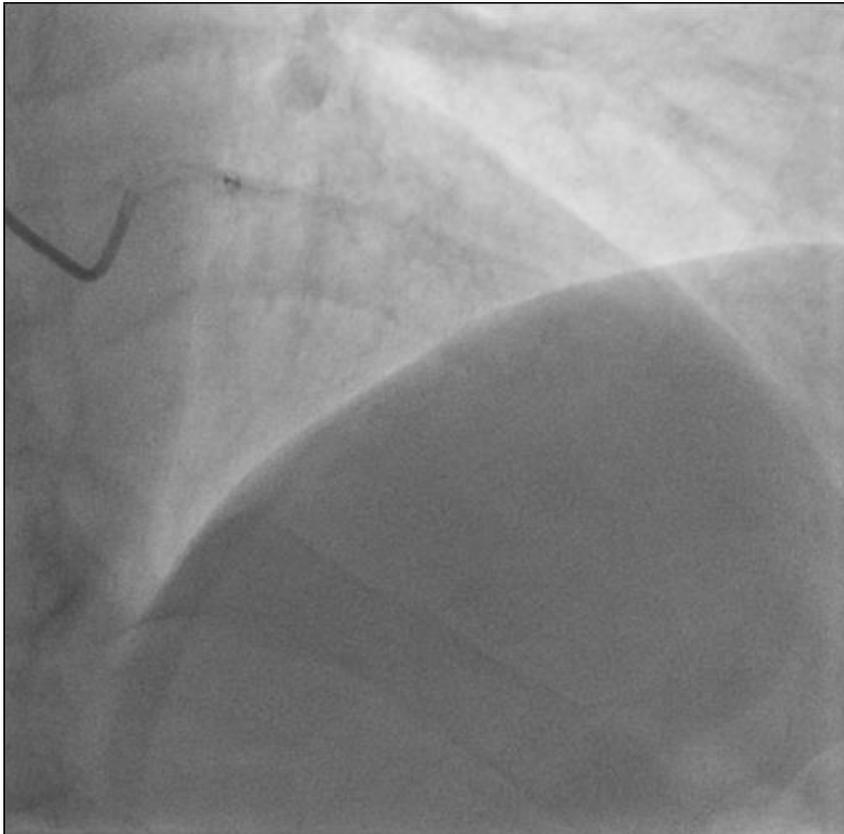
Case #2 – Clinical Data

- **65-yr old Male patient**
- **Medical History**
 - Diabetes, Smoking, Hypertension, Family Hx of early CAD
 - Thyroid disease
- **Clinical Presentation**

Non-ST segment Elevation Myocardial Infarction (NSTEMI)
- **Echocardiogram: EF 50%**

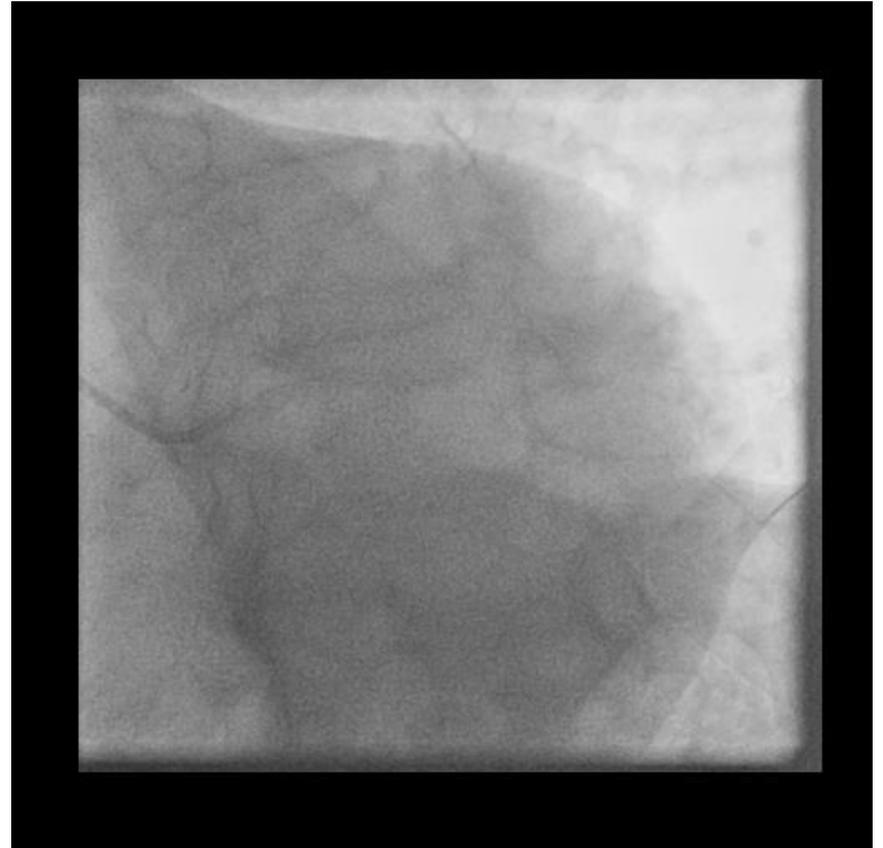
Case #2 – LCA Angiogram

Significant LAD disease (proximal and middle)



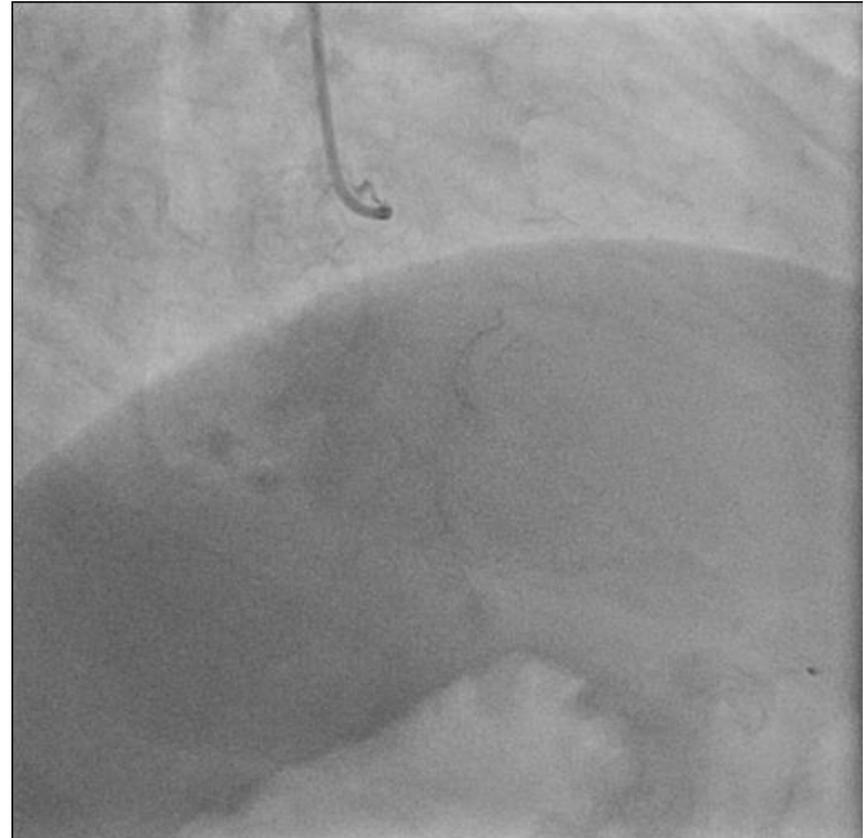
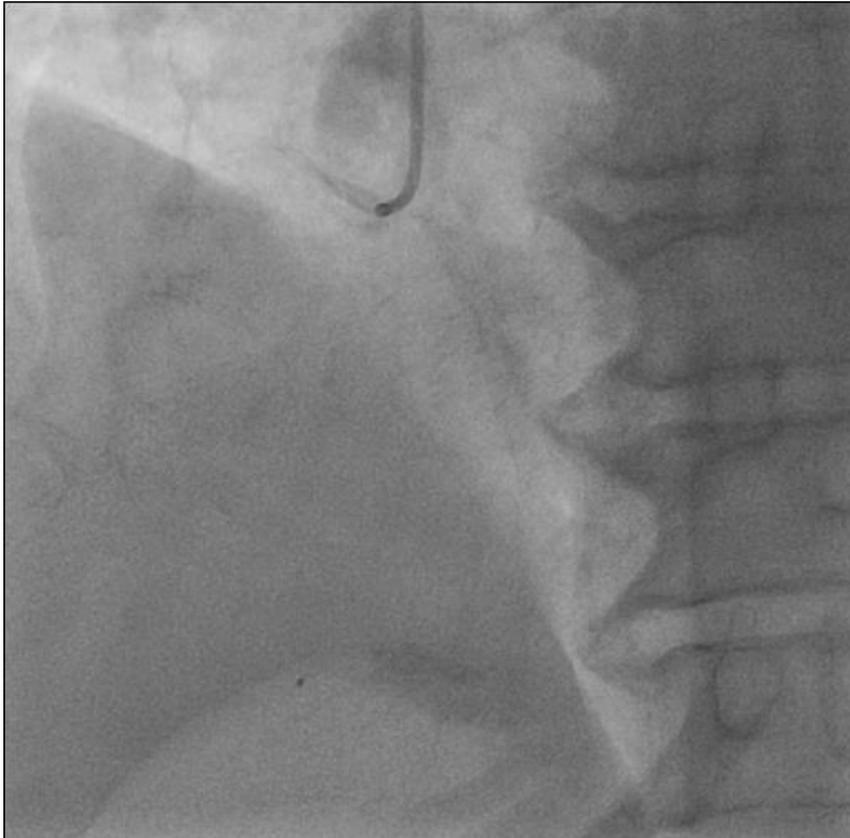
Case #2 – LCA Angiogram

Significant LCx and IM disease



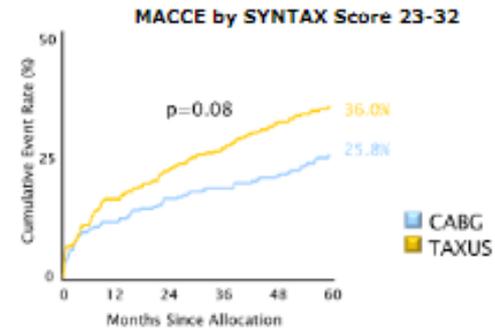
Case #2 – RCA Angiogram

Significant RCA disease



SYNTAX score

Intermediate Syntax score I



The cumulative MACCE rate is displayed for the SYNTAX Trial group this score corresponds to.

SYNTAX Score I

| | |
|---|-----------------------|
| Lesion 1 (segment 6): 3.5x2= Sub total lesion 1 | 7 7 |
| Lesion 2 (segment 11): 1.5x2= Sub total lesion 2 | 3 3 |
| Lesion 3 (segment 12a): 1x2= Bifurcation Type: Medina 1,1,1: Angulation <70° Sub total lesion 3 | 2 2 1 5 |
| Lesion 4 (segment 12): 1x2= Length >20 mm Sub total lesion 4 | 2 1 3 |
| Lesion 5 (segment 1): 1x2= (segment 2): 1x2= Length >20 mm Heavy calcification Sub total lesion 5 | 2 2 1 2 7 |
| Lesion 6 (segment 7): 2.5x2= Length >20 mm Sub total lesion 6 | 5 1 6 |
| TOTAL: | 31 |

SYNTAX score II

SYNTAX Score II questions

SYNTAX Score II



SYNTAX Score I 

Age (years) 

CrCl  mL/min

LVEF (%) 

Left Main  no yes

Gender male female

COPD  no yes

PVD  no yes

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

PCI

SYNTAX Score II: 31.4
PCI 4 Year Mortality: 7.6 %

CABG

SYNTAX Score II: 25.8
CABG 4 Year Mortality: 4.8 %

Treatment recommendation : CABG

STS score

STS Adult Cardiac Surgery Database Version 2.9

RISK SCORES

Procedure: Isolated CAB

CALCULATE

Risk of Mortality: 1.394%

Renal Failure: 1.451%

Permanent Stroke: 1.459%

Prolonged Ventilation: 6.616%

DSW Infection: 0.127%

Reoperation: 2.012%

Morbidity or Mortality: 10.296%

Short Length of Stay: 59.130%

Long Length of Stay: 3.012%

PRINT

CLEAR

Details of Selected Field:

Status

Indicate the clinical status of the patient prior to entering the operating room.

Euroscore II



Patient related factors

| | |
|---|-------------------------------------|
| Age | <input type="text" value="65"/> |
| Gender | <input type="radio"/> Male |
| Chronic pulmonary disease | <input type="radio"/> No |
| Extracardiac arteriopathy | <input type="radio"/> No |
| Poor mobility | <input type="radio"/> No |
| Previous Cardiac Surgery | <input type="radio"/> No |
| Active endocarditis | <input type="radio"/> No |
| Critical preoperative state | <input type="radio"/> No |
| Renal impairment | <input type="text" value="normal"/> |
| <input type="button" value="Creatinine Clearance"/> | |
| Diabetes on insulin | <input type="radio"/> No |

Cardiac related factors

| | |
|------------------------|--------------------------------------|
| Engina CCS Class IV | <input type="radio"/> No |
| LV function | <input type="text" value="good"/> |
| Recent MI | <input checked="" type="radio"/> Yes |
| Pulmonary hypertension | <input type="radio"/> No |
| NYHA | <input type="text" value="I"/> |

Operation related factors

| | |
|---------------------------|---------------------------------------|
| Surgery on thoracic aorta | <input type="radio"/> No |
| Urgency | <input type="text" value="urgent"/> |
| Weight of the operation | <input type="text" value="isolated"/> |

EuroSCORE II

0.92 %

Based on the information you have provided... if 100 similar patients, had an operation, **0.92** may be expect to die, whereas **99.08** would be expected to survive. Your EuroSCORE is **0.92**.



Decision Making

Review of patient by Cardio-Thoracic team on an urgent basis

Recommendation for CABG

Patient Preference: Accepted recommendation

Decision for CABG

Case #3

Case #3 – Clinical Data

- **61-yr old Male patient**
- **Medical History**
 - Diabetes, Ex-smoker
 - Known coronary artery disease with recent NSTEMI without revascularisation
 - Recent SPECT(Thallium): viable in all myocardial walls
 - Tuberculosis
- **Clinical Presentation**

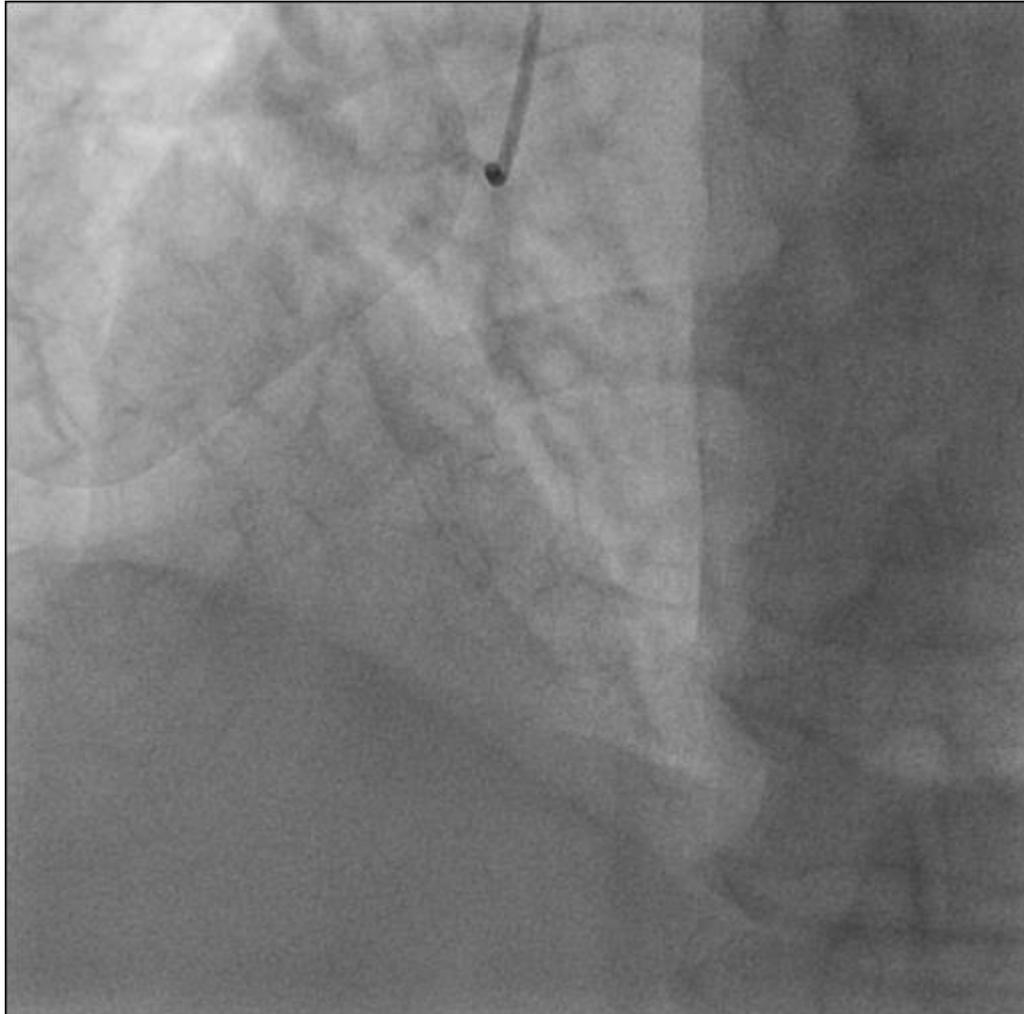
Non-ST segment Elevation Myocardial Infarction (NSTEMI) with recurrent symptoms and ongoing Troponin increase (2000 to 6000 pg/ml) within 48 hours
- **Echocardiogram: EF 35%**

Case #3 – LCA Angiogram

Significant LAD/Diagonal disease (with thrombus burden)
and significant LCx disease



Case #3 – RCA Angiogram

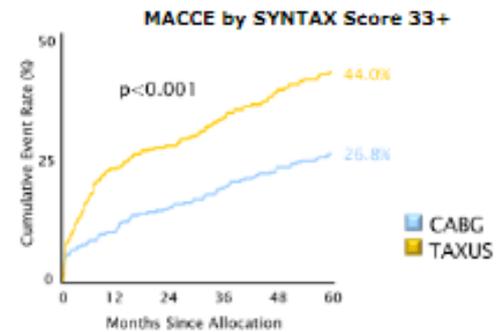


How would you proceed

- PCI
- CABG
- I need to estimate the different scores

SYNTAX score

High
Syntax score I



The cumulative MACCE rate is displayed for the SYNTAX Trial group this score corresponds to.

SYNTAX Score I

Lesion 1

| | |
|---------------------------------|-----------|
| (segment 6): 3.5x2= | 7 |
| (segment 7): 2.5x2= | 5 |
| (segment 9): 1x2= | 2 |
| Bifurcation Type: Medina 1,1,1: | 2 |
| Angulation <70° | 1 |
| Thrombus | 1 |
| Sub total lesion 1 | 18 |

Lesion 2

| | |
|---------------------------|----------|
| (segment 9): 1x2= | 2 |
| Length >20 mm | 1 |
| Sub total lesion 2 | 3 |

Lesion 3

| | |
|---------------------------|----------|
| (segment 11): 1.5x2= | 3 |
| Length >20 mm | 1 |
| Sub total lesion 3 | 4 |

Lesion 4

| | |
|---|-----------|
| segment number(s) | |
| (segment 3): 1x5= | 5 |
| (segment 4): 1x2= | 2 |
| Age T.O. is unknown | 1 |
| + Bridging | 1 |
| the first segment beyond the T.O. visualized by contrast: 4 | 0 |
| + sidebranch: Yes, all sidebranches ≥1.5mm | 1 |
| Bifurcation Type: Medina 1,1,0: | 1 |
| Sub total lesion 4 | 11 |

TOTAL: **36**

SYNTAX score II

SYNTAX Score II questions

SYNTAX Score II

SYNTAX II

SYNTAX Score I 

36

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

Age (years) 

61

PCI

SYNTAX Score II:

43.8

PCI 4 Year Mortality:

20.2 %

CrCl 

63

mL/min

CABG

SYNTAX Score II:

26.5

CABG 4 Year Mortality:

5.1 %

LVEF (%) 

35

Treatment recommendation : CABG

Left Main 

no yes

Gender

male female

COPD 

no yes

PVD 

no yes

STS score

STS Adult Cardiac Surgery Database Version 2.9

RISK SCORES

Procedure: Isolated CAB

CALCULATE

Risk of Mortality: 3.498%

Renal Failure: 4.515%

Permanent Stroke: 2.856%

Prolonged Ventilation: 20.623%

DSW Infection: 0.265%

Reoperation: 4.573%

Morbidity or Mortality: 26.077%

Short Length of Stay: 29.188%

Long Length of Stay: 10.730%

PRINT

CLEAR

Details of Selected Field:

ACE or ARB

Indicate whether the patient received ACE Inhibitors or ARB within 48 hours preceding surgery (e.g., if indicated for LV dysfunction or acute MI).

Euroscore II

Patient related factors

| | |
|--------------------------------------|-------------------------------------|
| Age | <input type="text" value="61"/> |
| Gender | <input type="checkbox"/> Male |
| Chronic pulmonary disease | <input type="checkbox"/> No |
| Extracardiac arteriopathy | <input type="checkbox"/> No |
| Poor mobility | <input type="checkbox"/> No |
| Previous Cardiac Surgery | <input type="checkbox"/> No |
| Active endocarditis | <input type="checkbox"/> No |
| Critical preoperative state | <input type="checkbox"/> No |
| Renal impairment | <input type="text" value="normal"/> |
| Creatinine Clearance | |
| Diabetes on insulin | <input type="checkbox"/> No |

Cardiac related factors

| | |
|------------------------|---------------------------------------|
| Engina CCS Class IV | <input type="checkbox"/> Yes |
| LV function | <input type="text" value="moderate"/> |
| Recent MI | <input type="checkbox"/> Yes |
| Pulmonary hypertension | <input type="text" value="No"/> |
| NYHA | <input type="text" value="I"/> |

Operation related factors

| | |
|---------------------------|--|
| Surgery on thoracic aorta | <input type="checkbox"/> No |
| Urgency | <input type="text" value="urgent"/> |
| Weight of the operation | <input type="text" value="isolated ca"/> |

EuroSCORE II

1.39 %

Based on the information you have provided... If 100 similar patients, had an operation, **1.39** may be expect to die, whereas **98.61** would be expected to survive. Your EuroSCORE is **1.39**.

[reset](#) [cancel](#)

Euroscore I

For comparison purposes to Trials

| Patient related factors | |
|-----------------------------|---------------------------------|
| Age | <input type="text" value="61"/> |
| Gender | <input type="radio"/> Male |
| Chronic pulmonary disease | <input type="checkbox"/> No |
| Extracardiac arteriopathy | <input type="checkbox"/> No |
| Poor mobility | <input type="checkbox"/> No |
| Previous Cardiac Surgery | <input type="checkbox"/> No |
| Creatinine | <input type="checkbox"/> No |
| Active endocarditis | <input type="checkbox"/> No |
| Critical preoperative state | <input type="checkbox"/> No |

| Cardiac related factors | |
|-------------------------|---|
| Engina CCS Class IV | <input checked="" type="checkbox"/> Yes |
| LV function | <input type="text" value="moderate"/> |
| Recent MI | <input checked="" type="checkbox"/> Yes |
| Pulmonary hypertension | <input type="checkbox"/> No |

| Operation related factors | |
|-----------------------------|-----------------------------|
| Emergency | <input type="checkbox"/> No |
| Other than isolated CABG | <input type="checkbox"/> No |
| Surgery on thoracic aorta | <input type="checkbox"/> No |
| Post infarct septal rupture | <input type="checkbox"/> No |

| EuroSCORE I | |
|---|---------------------------------------|
| 3.95 % | |
| Based on the information you have provided... if 100 similar patients, had an operation, 3.95 may be expect to die, whereas 96.05 would be expected to survive. Your EuroSCORE is 3.95 . | |
| <input type="button" value="reset"/> | <input type="button" value="cancel"/> |

How would you proceed ?

Syntax score I: 36 (High)

Syntax score II: High mortality for PCI vs CABG

SYNTAX Score II

SYNTAX II

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

PCI

SYNTAX Score II: 43.8
PCI 4 Year Mortality: 20.2 %

CABG

SYNTAX Score II: 26.5
CABG 4 Year Mortality: 5.1 %

Treatment recommendation ⓘ: CABG

Surgical Risk

STS Adult Cardiac Surgery Database Version 2.9

RISK SCORES

Procedure: Isolated CAB

CALCULATE

Risk of Mortality: 3.498%

Renal Failure: 4.515%

Permanent Stroke: 2.856%

Prolonged Ventilation: 20.623%

DSW Infection: 0.265%

Reoperation: 4.573%

Morbidity or Mortality: 26.077%

Short Length of Stay: 29.188%

Long Length of Stay: 10.730%

PRINT CLEAR

Details of Selected Field:
ACE or ARB

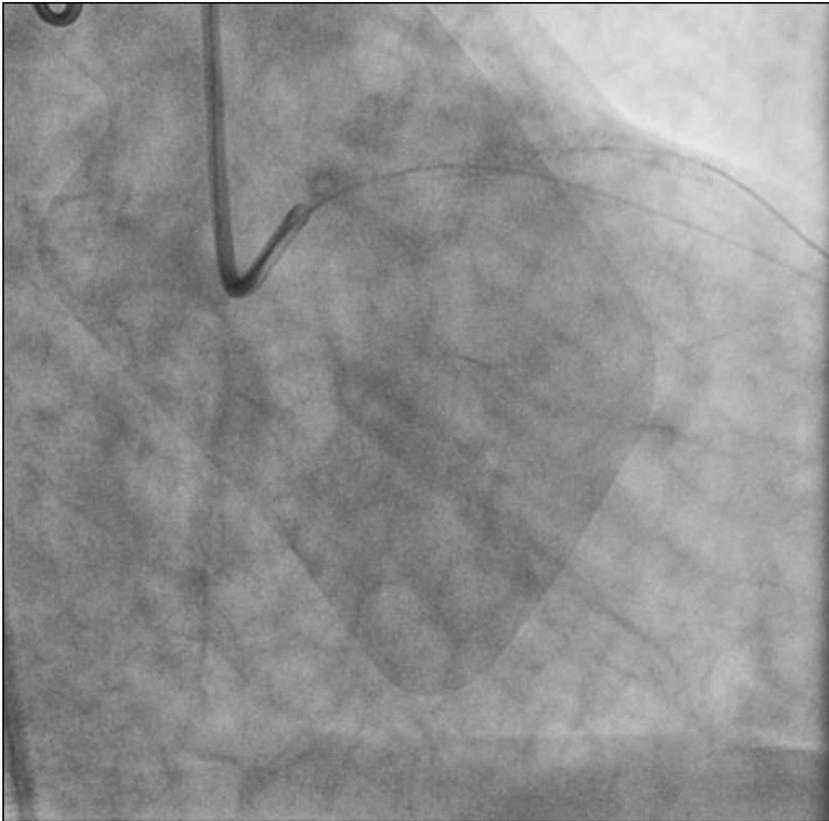
Indicate whether the patient received ACE Inhibitors or ARB within 48 hours preceding surgery (e.g., if indicated for LV dysfunction or acute MI).

Decision Making

Decision for PCI

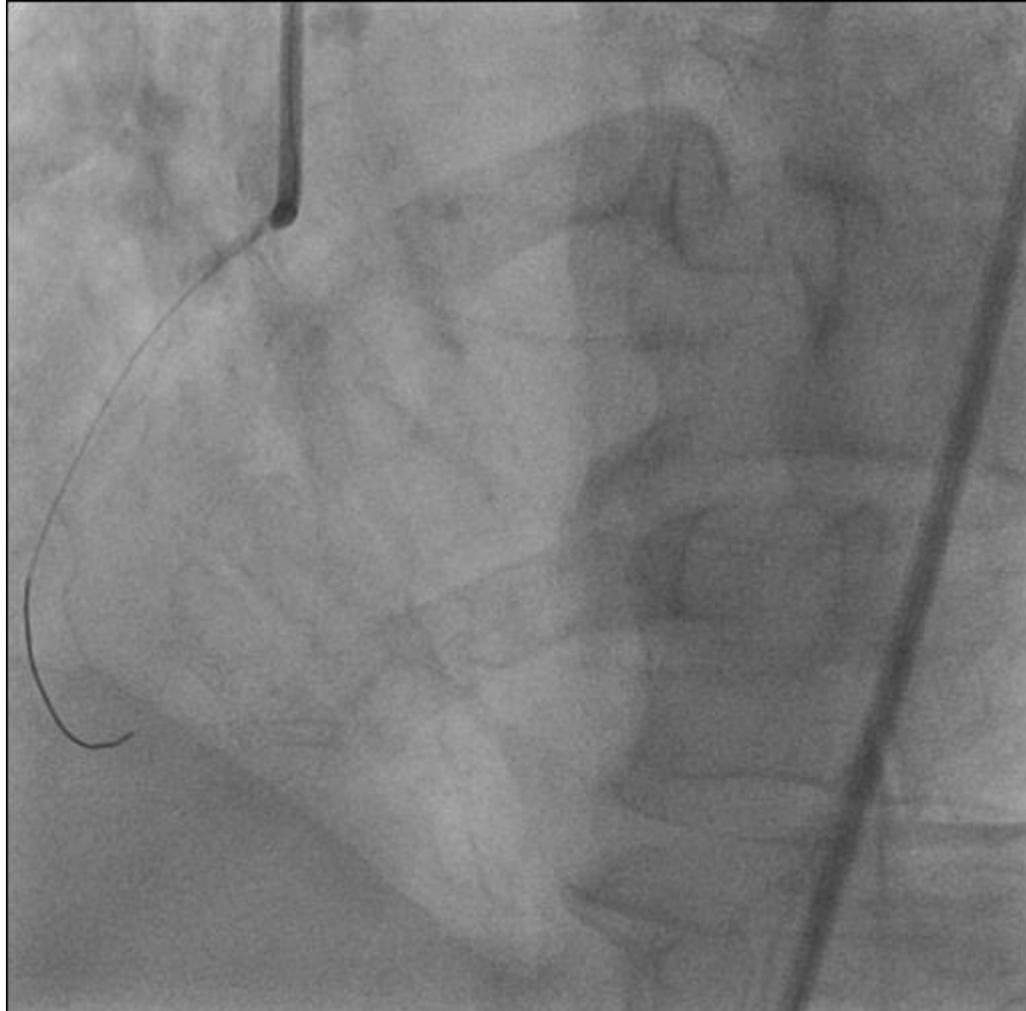
PCI LAD

PCI result



Staged PCI RCA

PCI result



Case #4

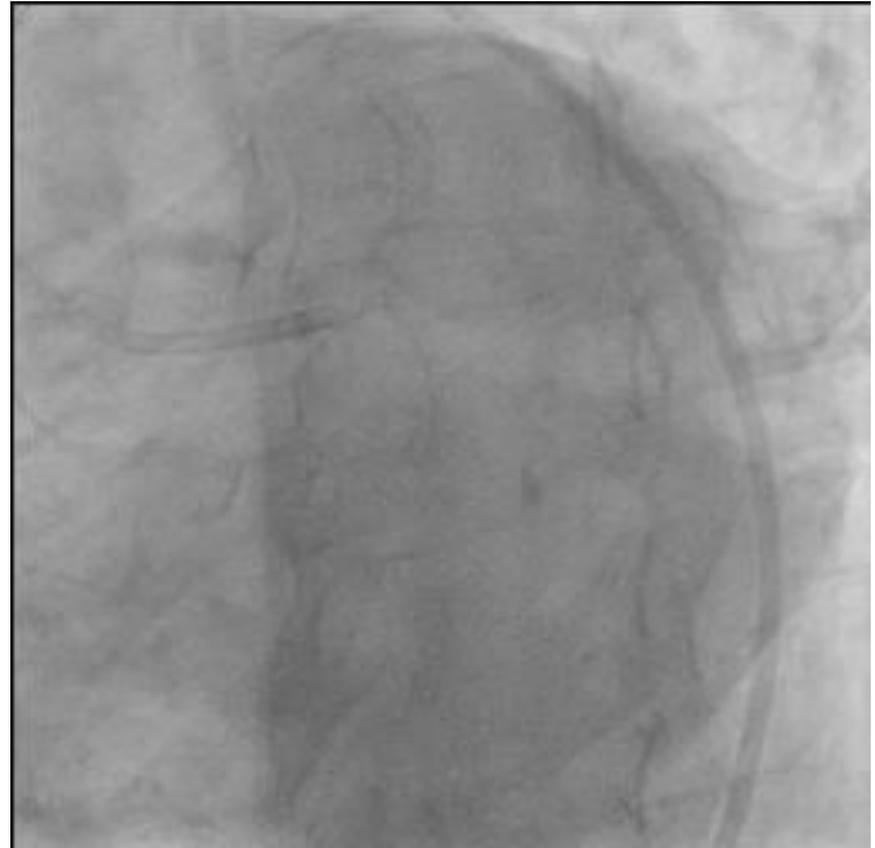
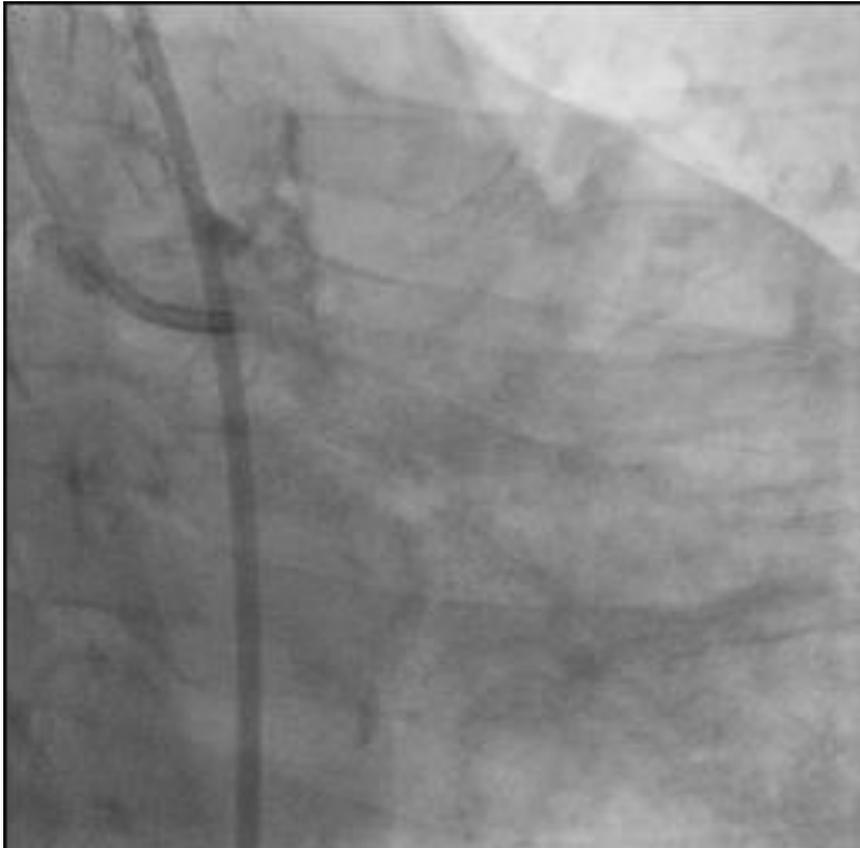
Case #4 – Clinical Data

- **83-yr old Male patient**
- **Medical History**
 - Diabetes, Ex-smoker
 - Known coronary artery disease with PCI mid LAD (unstable angina)
 - Surgical revascularisation of carotid disease
 - Prostate Cancer under radiotherapy
- **Clinical Presentation**

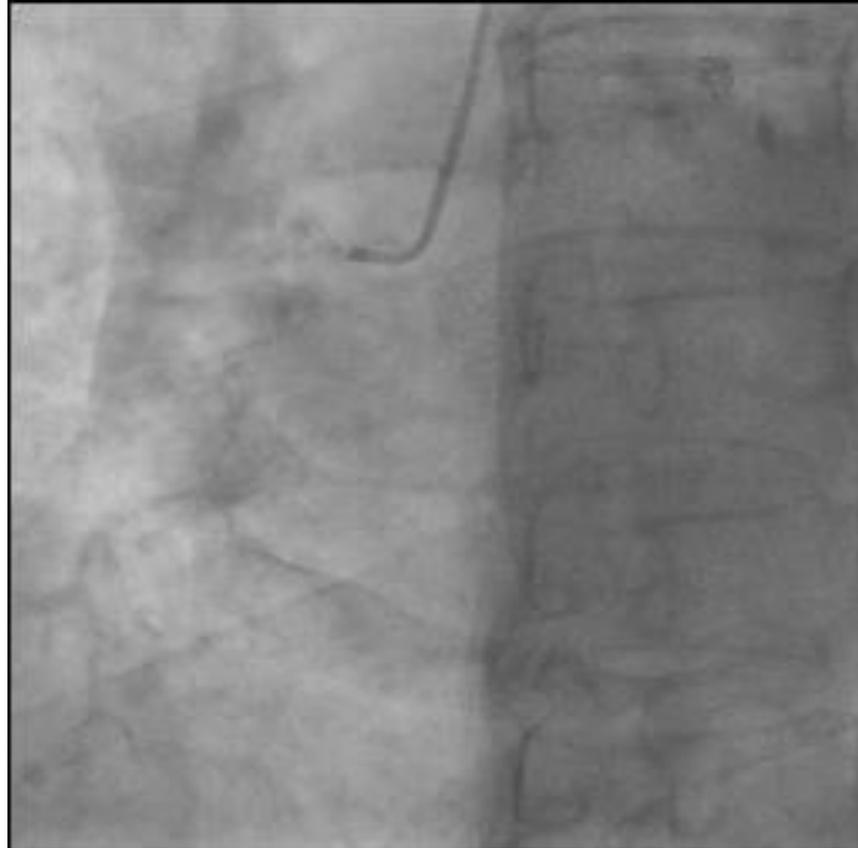
Unstable angina – Positive Stress Echo
- **Echocardiogram: EF 50%**

Case #4 – LCA Angiogram

Significant LM bifurcation/LAD/LCx disease

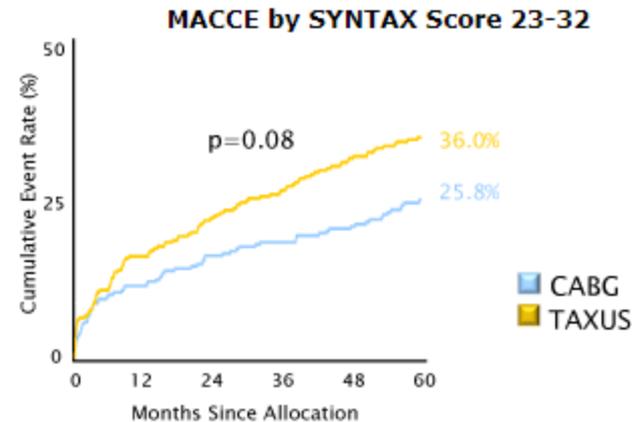


Case #4 – RCA Angiogram



SYNTAX score

Intermediate
Syntax score I



The cumulative MACCE rate is displayed for the SYNTAX Trial group this score corresponds to.

SYNTAX Score I

Lesion 1

| | |
|---------------------------------|-----------|
| (segment 5): 5x2= | 10 |
| (segment 6): 3.5x2= | 7 |
| (segment 11): 1.5x2= | 3 |
| Bifurcation Type: Medina 1,1,1: | 2 |
| Aorto Ostial lesion | 1 |
| Heavy calcification | 2 |
| <i>Sub total lesion 1</i> | <i>25</i> |

TOTAL: 25

SYNTAX score II

SYNTAX Score II questions

SYNTAX Score II

SYNTAX II

SYNTAX Score I i

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

Age (years) i

PCI

SYNTAX Score II: 36.3
PCI 4 Year Mortality: 11.3 %

CrCl i mL/min

CABG

SYNTAX Score II: 45.8
CABG 4 Year Mortality: 23.3 %

LVEF (%) i

Treatment recommendation i: PCI

Left Main i no yes

Gender male female

COPD i no yes

PVD i no yes

STS score

STS Adult Cardiac Surgery Database Version 2.9

RISK SCORES

Procedure: Isolated CAB

CALCULATE

Risk of Mortality: 1.615%

Renal Failure: 1.569%

Permanent Stroke: 1.044%

Prolonged Ventilation: 4.966%

DSW Infection: 0.147%

Reoperation: 1.862%

Morbidity or Mortality: 8.587%

Short Length of Stay: 41.740%

Long Length of Stay: 3.780%

PRINT

CLEAR

Details of Selected Field:

Status

Indicate the clinical status of the patient prior to entering the operating room.

Euroscore II



Patient related factors

| | |
|--------------------------------------|---|
| Age | <input type="text" value="83"/> |
| Gender | <input type="radio"/> Male |
| Chronic pulmonary disease | <input type="checkbox"/> No |
| Extracardiac arteriopathy | <input checked="" type="checkbox"/> Yes |
| Poor mobility | <input type="checkbox"/> No |
| Previous Cardiac Surgery | <input type="checkbox"/> No |
| Active endocarditis | <input type="checkbox"/> No |
| Critical preoperative state | <input type="checkbox"/> No |
| Renal impairment | <input type="text" value="normal"/> |
| Creatinine Clearance | |
| Diabetes on insulin | <input type="checkbox"/> No |

Cardiac related factors

| | |
|------------------------|-----------------------------------|
| Engina CCS Class IV | <input type="checkbox"/> No |
| LV function | <input type="text" value="good"/> |
| Recent MI | <input type="checkbox"/> No |
| Pulmonary hypertension | <input type="checkbox"/> No |
| NYHA | <input type="text" value="I"/> |

Operation related factors

| | |
|---------------------------|--|
| Surgery on thoracic aorta | <input type="checkbox"/> No |
| Urgency | <input type="text" value="elective"/> |
| Weight of the operation | <input type="text" value="isolated cz"/> |

EuroSCORE II

1.62 %

Based on the information you have provided... if 100 similar patients, had an operation, **1.62** may be expect to die, whereas **98.38** would be expected to survive. Your EuroSCORE is **1.62**.

Decision Making

Heart Team

Recommendation for PCI

- Porcelain aorta
- Favorable Syntax II score for PCI

Patient Preference: Accepted decision for PCI

Decision for PCI

PCI LAD

PCI result



