Ολική επαναιμάτωση σε πρωτογενή αγγειοπλαστική.

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

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Level&lt;sup&gt;b&lt;/sup&gt;</th>
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<tr>
<td><strong>Strategy</strong></td>
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<tr>
<td>Routine revascularization of non-IRA lesions should be considered in patients with multivessel disease before hospital discharge&lt;sup&gt;211-214&lt;/sup&gt;</td>
<td>IIa</td>
<td>A</td>
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<tr>
<td>CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.</td>
<td>IIa</td>
<td>C</td>
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<tr>
<td>In cardiogenic shock, routine revascularization of non-IRA lesions is not recommended during primary PCI&lt;sup&gt;190&lt;/sup&gt;</td>
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<td>B</td>
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<td><strong>Technique</strong></td>
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<tr>
<td>Routine use of thrombus aspiration is not recommended&lt;sup&gt;223-226,228&lt;/sup&gt;</td>
<td>III</td>
<td>A</td>
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CABG: coronary artery bypass grafting; IRA: infarct-related artery; PCI: percutaneous coronary intervention; STEMI: ST-segment elevation myocardial infarction. <sup>a</sup>Class of recommendation. <sup>b</sup>Level of evidence.
**CHANGE IN RECOMMENDATIONS 2012 TO 2017**

**Radial Access**
- 2012: MATRIX\(^{143}\)
- 2017: MATRIX\(^{143}\)

**DES over BMS**
- 2012: EXAMINATION\(^{150,151}\), COMFORTABLE-AMI\(^{149}\), NORSTENT\(^{152}\)
- 2017: REVIEW\(^{153}\), OCTAVE•PLUS\(^{154}\), COMPARE-AMI\(^{156}\)

**Complete Revascularization**
- 2012: PRAMI\(^{168}\), DANAMI-3-PRIMULTI\(^{170}\), CVLPRIT\(^{169}\), COMPARE-Acute\(^{171}\)
- 2017: REVIEW\(^{153}\), OCTAVE•PLUS\(^{154}\), COMPARE-AMI\(^{156}\)

**Thrombus Aspiration**
- 2012: TOTAL\(^{159}\), TASTE\(^{157}\)
- 2017: NEW RECOMMENDATIONS

**Bivalirudin**
- 2012: MATRIX\(^{209}\), HEAT-PPCI\(^{205}\)
- 2017: NEW RECOMMENDATIONS

**Enoxaparin**
- 2012: ATOLL\(^{200,201}\), Meta-analysis\(^{202}\)
- 2017: NEW RECOMMENDATIONS

**Early Hospital Discharge**
- 2012: Small trials & observational data\(^{259-262}\)
- 2017: NEW RECOMMENDATIONS

**Oxygen when SaO2 < 95%**
- 2012: AVOID\(^{64}\), DETO2X\(^{66}\)
- 2017: Oxygen when SaO2 < 90%

**Dose i.V. TNK-tPA**
- 2012: same in all patients
- 2017: STREAM\(^{121}\)

**2017 NEW RECOMMENDATIONS**

- Additional lipid lowering therapy if LDL > 1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
  - IMPROVE-IT\(^{376}\), FOURIER\(^{382}\)
- Complete revascularization during index primary PCI in STEMI patients in shock
  - Expert opinion
- Cangrelor if P2Y\(_{12}\) inhibitors have not been given
  - CHAMPION\(^{193}\)
- Switch to potent P2Y\(_{12}\) inhibitors 48 hours after fibrinolysis
  - Expert opinion
- Extend Ticagrelor up to 36 months in high-risk patients
  - PEGASUS-TIMI 54\(^{333}\)
- Use of polypill to increase adherence
  - FOCUS\(^{323}\)
- Routine use of deferred stenting
  - DANAMI 3-DEFER\(^{155}\)
<table>
<thead>
<tr>
<th>IRA technique</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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<tbody>
<tr>
<td>Stenting is recommended (over balloon angioplasty) for primary PCI.</td>
<td>I</td>
<td>A</td>
<td></td>
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<td>Stenting with new-generation DES is recommended over BMS for primary PCI.</td>
<td>I</td>
<td>A</td>
<td></td>
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<tr>
<td>Radial access is recommended over femoral access if performed by an experienced radial operator.</td>
<td>I</td>
<td>A</td>
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<th>Non-IRA strategy</th>
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<td>Non-IRA PCI during the index procedure should be considered in patients with cardiogenic shock.</td>
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<td>CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.</td>
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A randomised trial of target-vessel versus multi-vessel revascularisation in ST-elevation myocardial infarction: major adverse cardiac events during long-term follow-up

Luigi Politi, Fabio Sgura, Rosario Rossi, Daniel Monopoli, Elisa Guerri, Chiara Leuzzi, Francesca Bursi, Giuseppe Massimo Sangiorgi and Maria Grazia Modena

Methods The outcomes of 214 consecutive patients with STEMI and multivessel CAD undergoing primary angioplasty were studied. Before the first angioplasty patients were randomly assigned to three different strategies: culprit vessel angioplasty-only (COR group); staged revascularisation (SR group) and simultaneous treatment of non-IRA (CR group).

Results During a mean follow-up of 2.5 years, 42 (50.0%) patients in the COR group experienced at least one major adverse cardiac event (MACE), 13 (20.0%) in the SR group and 15 (23.1%) in the CR group, \(p<0.001\). In-hospital death, repeat revascularisation and re-hospitalisation occurred more frequently in the COR group (all \(p<0.05\)), whereas there was no significant difference in re-infarction among the three groups. Survival free of MACE was significantly reduced in the COR group but was similar in the CR and SR groups.

CONCLUSIONS

In a contemporary homogeneous cohort of patients with STEMI and multivessel CAD treated with primary PCI, COR angioplasty was associated with the highest rate of MACE compared with multivessel treatment. Patients scheduled for staged revascularisation experienced a similar rate of MACE to patients undergoing complete simultaneous treatment of non-IRA. This novel finding of our study should promote further research in order to provide strong enough evidence that may eventually update the current recommendations for patients with multivessel CAD and STEMI.
Randomized Trial of Preventive Angioplasty in Myocardial Infarction

David S. Wald, M.D., Joan K. Morris, Ph.D., Nicholas J. Wald, F.R.S., Alexander J. Chase, M.B., B.S., Ph.D., Richard J. Edwards, M.D., Liam O. Hughes, M.D., Colin Berry, M.B., Ch.B., Ph.D., and Keith G. Oldroyd, M.D., for the PRAMI Investigators

CONCLUSIONS

In patients with STEMI and multivessel coronary artery disease undergoing infarct-artery PCI, preventive PCI in noninfarct coronary arteries with major stenoses significantly reduced the risk of adverse cardiovascular events, as compared with PCI limited to the infarct artery. (Funded by Barts and the London Charity; PRAMI Current Controlled Trials number, ISRCTN73028481.)
Should we now adopt this strategy for our patients with STEMI and multivessel disease in clinical practice?

I do not think so, because PRAMI has a number of limitations.

The **patients in the conservative group** did not undergo a staged PCI or even a test for ischemia, a strategy recommended in ESC guidelines. So the patients in the conservative group were treated not optimal and not to current clinical standards. PCI of all lesions > 50% without any proof of the hemodynamic significance of the lesion e.g. by FRR will certainly lead to interventions in a number of insignificant stenosis.
Complete vs culprit-only revascularisation for PCI STEMI: CvLPRIT Trial

Objective: to test feasibility, safety and benefit of complete revascularisation vs culprit-revascularisation in STEMI

Study: multicentre, randomised study

Population: patients with STEMI and multivessel disease undergoing primary PCI

Endpoints: composite all-cause death, re-MI, heart failure and ischemia-driven revascularisation within 12 months
Complete revascularisation was associated with non-significant reduction in death, MI, heart failure or repeat-revascularisation.

**Conclusion:** in patients with STEMI and multivessel disease complete revascularisation is associated with reduced MACE at 12 months as compared to culprit-only revascularisation.

*Gershlick et al. J Am Coll Cardiol 2015;65:963-72*
STEMI: complete revascularisation vs culprit lesion only: DANAMI-3 – PRIMULTI

Objective: to evaluate the clinical outcome of complete revascularisation using an FFR-guided approach compared to culprit vessel treatment only for patients with STEMI and multivessel disease.

Study: open label, randomised controlled trial.

Population: patients with STEMI less than 12 hrs duration and having multivessel disease.

Endpoints: composite all-cause death, re MI, ischaemia-driven revascularisation of lesions in non-infarct related arteries at follow-up 27 months median.

Diagram:
- Patients 627
  - infarct vessel only 313
  - complete revascularisation 314 (2 days after PPCI)
No differences in all-cause death or re-MI. Ischaemia-driven revascularisation culprit only 17% vs complete revascularisation 5%.

**Conclusion:** FFR-guided complete revascularisation in STEMI with multivessel disease reduces ischaemia driven revascularisation compared to culprit lesion treatment only, but there was no difference of all-cause death or re-MI.
Fractional flow reserve-guided multivessel angioplasty in myocardial infarction: Compare-Acute

<table>
<thead>
<tr>
<th>Objective</th>
<th>to compare FFR guided complete revascularisation with infarct-related artery only revascularisation in STEMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study</td>
<td>multicentre, randomised, investigator-initiated; 1:2 ratio</td>
</tr>
<tr>
<td>Population</td>
<td>patients with STEMI and multivessel disease who had undergone primary PCI of an infarct-related coronary artery</td>
</tr>
<tr>
<td>Endpoints</td>
<td>composite all-cause death, nonfatal myocardial infarction, revascularisation and cerebrovascular events at 12 months</td>
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![Diagram showing patient distribution and treatment outcomes]
The Compare-Acute trial of fractional flow reserve-guided multivessel angioplasty in myocardial infarction
The Compare-Acute trial of fractional flow reserve-guided multivessel angioplasty in myocardial infarction
**Objective**
to compare culprit only (±Staged) PCI with immediate multi-vessel PCI in patients with myocardial infarction and shock

**Study**
 multicentre, open-label randomised trial

**Population**
 patients who had multi-vessel disease, acute myocardial infarction, and cardiogenic shock

**Endpoints**
 composite of death or severe renal failure leading to renal-replacement therapy within 30 days after randomisation

<table>
<thead>
<tr>
<th>Patients</th>
<th>CULPRIT only PCI±Staged: 344</th>
</tr>
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<tr>
<td>706</td>
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| Immediate multivessel: 341 |
Conclusion  the 30-day risk of a composite 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 multi-vessel PCI

PCI of non-IRA

Index procedure: PRAMI+COMPARE-ACUTE

Staged (during hospital admission):
   DANAMI 3 PRIMULTI

Any time before discharge (immediate or staged):
   CULPRIT
Indication for PCI

- PRAMI: angiography-guided in lesions >50%
- CULPRIT: angiography-guided in lesions >70%
- DANAMI-3-PRIMULTI: FFR
- COMPARE ACUTE: FFR
Multivessel PCI in STEMI: ready to be the recommended strategy?
Conclusions

• *No study* will ever be able to define fully a common strategy for all STEMI patients with MVD.

• These patients are very heterogeneous, any revascularisation strategy should be *individualised* in this high-risk group of STEMI patients

• The *extent of coronary artery disease* (assessed by SYNTAX score) was an independent predictor of mortality in STEMI patients undergoing primary PCI

• Focus first on the *best possible p-PCI result* on the culprit lesion which brought the patient to the cathlab

• A *complicated p-PCI* with long procedural time, significant contrast load and a suboptimal result, including “slow or no-reflow” and/or distal embolisation, would definitively argue against additional non-culprit PCI in a stable patient during the index procedure.

• *Complex angiographic characteristics* of non-culprit lesions and predicted PCI complexity would argue for a staged approach.

• Left ventricular/valve function, a complete risk profile, including age and *comorbidities*, has to be integrated into the decision-making process to select the best revascularisation strategy

• In a patient with complex multivessel disease, impaired left ventricular function and diabetes, *surgical revascularisation* could be considered despite STEMI as the index event.

• Physiological evaluation of non-culprit lesions using *FFR* should be encouraged to define the right targets for revascularisation.
In urgent clinical situations such as STEMI

- a complete clinical history
- including expected compliance to drug
- planned invasive procedure

is often difficult to obtain and, in a doubtful situation, the wise approach could be to postpone additional revascularization until after discussion, with the patient, his family and the referring physician.