Επαναγγείωση σε σοβαρή καρδιακή ανεπάρκεια - Θα χειρουργήσω χωρίς βιωσιμότητα

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Φεβρουάριος 2018, Θεσ/νίκη
I have no conflicts of interest to declare.
Θάσος - Λιμενάρια
Radionuclide Myocardial Perfusion Imaging & Revascularization

Among patients with no ischemia or mild ischemia by SPECT MPI, medical therapy and revascularization provide equivalent survival benefit however, in retrospective studies, revascularization is associated with improved survival compared with medical therapy in patients with moderate to severe ischemia (>10% ischemia)


Results from retrospective studies have been similar in diabetics and in the elderly. In diabetic patients, coronary artery bypass grafting was associated with improved survival among patients with moderate to severe ischemia as detected by SPECT MPI


Among elderly patients without known CAD a benefit from revascularization was observed only in patients with ischemic myocardium ≥15%

Radionuclide Myocardial Perfusion Imaging & Revascularization

Studies support using SPECT MPI to identify patients with inducible ischemia who may benefit from revascularization. However, nuclear substudies of randomized controlled trials have been conflicting and generally underpowered.

There is evidence for improved survival with revascularization in patients with evidence of ischemia on Rb82 PET imaging from preliminary studies presented recently.

It is noteworthy that the magnitude of reversible perfusion defect on PET to demonstrate a survival benefit was less than that previously reported with SPECT.

Shaw LJ, Berman DS, Maron DJ, et al. Optimal medical therapy with or without percutaneous coronary intervention to reduce ischemic burden: Results from the clinical outcomes utilizing revascularization and aggressive drug evaluation (COURAGE) trial nuclear substudy. Circulation. 2008; 117(10):1283-1291


FDG-PET & Revascularization

The extent and severity of hibernating myocardium detected and quantified by 18F-fluorodeoxyglucose (FDG)-PET may also select patients that would benefit from revascularization. In PARR-2, patients with LV dysfunction were randomized to a strategy of viability imaging with FDG-PET guided revascularization vs standard care.

There was no improvement in outcomes in the FDG-PET patients

However, a significant number of patients in the PARR-2 trial were not revascularized according to recommendations based on FDG-PET results. In a subsequent substudy of the PARR-2 trial, patients with severe LV systolic dysfunction who underwent revascularization according to the extent of viable myocardium, revascularization was associated with improved outcomes.

In a more recent retrospective study of 648 patients who underwent FDG-PET with RB82 for perfusion, revascularization was superior to medical therapy with respect to survival among patients with more than 10% hibernating myocardium. Thus, in patients with reduced left ventricular systolic function, current evidence supports revascularization on the basis of myocardial viability as assessed with PET, but this hypothesis needs to be confirmed in a randomized trial.


Πιερία - Λιτόχωρο
Cardiac MR & Revascularization

Retrospective data support using viability assessment with CMR to select patients with poor left ventricular systolic function for revascularization, but the studies are small and randomized trials are needed.

CMR data demonstrating an ischemic threshold that identifies patients who benefit from revascularization is altogether lacking


In a patient with a reduced LVEF, the ideal options would be PET or CMR imaging as the amount of viable myocardium can be accurately quantified using these techniques. Patients with a significant amount of viable myocardium would benefit from revascularization; however, patients with large amounts of scar or a dilated ventricle would be better served with medical therapy.

Among patients with a normal or mildly reduced LVEF, SPECT, PET, CMR, and CCTA may be considered. If there is a significant amount of ischemia (≥10%) on perfusion imaging with SPECT or PET, revascularization would be recommended. Patients without significant myocardial ischemia by SPECT or PET may not benefit from revascularization and would be ideally managed with maximal medical therapy.
Πήλιο - Νταμούχαρη
SPECT has a long history of effective risk stratification, and more recently, normal findings on CCTA have been associated with an excellent short-term prognosis. CFR, as it reflects the final common pathway of many pathophysiological processes that affect the macrovasculature and microvasculature, is tremendously powerful for prognostication.

Several retrospective SPECT studies support an ischemic threshold to identify patients who realize a survival benefit with revascularization. In patients with a reduced ejection fraction, PET and MRI may likewise identify patients who should undergo revascularization.
Χαλκιδική - Ουρανούπολη
Myocardial viability for decision-making concerning revascularization in patients with left ventricular dysfunction and coronary artery disease: A meta-analysis of non-randomized and randomized studies

Ándres Orlandini, Noelia Castellana, Andrea Pascual, Fernando Botto, M. Cecilia Bahit, Carolina Chacon, M. Luz Diaz, Rafael Diaz

Non-Randomized trials:
2050 rev by PCI or CABG
2278 medically

Randomized trials:
534 rev by PCI or CABG
545 medically
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Non - Randomized trials

Randomized trials
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Non - Randomized studies:
Μείωση της θνητότητας ανεξάρτητα από την ύπαρξη βιώσιμου μυοκαρδίου

Randomized studies:
Μη στατιστικά σημαντικό όφελος από την επαναιμάτωση στον συνολικό πληθυσμό
Δεν μπορούμε να εξάγουμε ως συμπέρασμα όφελος ή ζημία από την επαναιμάτωση

Περιορισμοί των Non-Randomized μελετών:
Πολλές μικρές μελέτες
Άλλες προσπιτικές και άλλες αναδρομικές
Κάποιες απαντούν στη βιωσιμότητα με ένα ναι ή όχι
Διαφορετικές δοκιμασίες βιωσιμότητας
Διαφορετικά follow-up
Μεγάλη κατανομή στο χρόνο των μελετών

Περιορισμοί των Randomized μελετών:
Κάποιες απαντούν στη βιωσιμότητα με ένα ναι ή όχι
Διαφορετικές δοκιμασίες βιωσιμότητας
Διαφορετικά follow-up
Λίγοι ασθενείς με μη βιώσιμο μυοκάρδιο
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The available data are not conclusive regarding the usefulness of myocardial viability tests in the decision-making process concerning revascularization in patients with LVD-CAD.

Patients with viable myocardium appear to benefit from revascularization, but the same benefits were observed in patients without viable myocardium. Moreover, a neutral or adverse effect of revascularization cannot be excluded in either group of patients.
Άγιος Ευστράτιος - Λιμάνι
Myocardial viability and revascularization

The risk-benefit balance for revascularization in patients without angina/ischaemia or viable myocardium remains uncertain. In an observational study using cardiac imaging techniques (stress-rest Rb-82/F-18 fluorodeoxyglucose PET) in 648 patients with an LVEF of 31%±12%, hibernating myocardium, ischaemic myocardium, and scarred myocardium were associated with all-cause death (P=0.0015; P=0.0038, and P=0.0010, respectively).

2014 ESC/EACTS Guidelines on myocardial revascularization
The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

European Heart Journal (2014) 35, 2541-2619
An interaction between treatment and hibernating myocardium was present, such that early revascularization in the setting of hibernating myocardium, when compared with medical therapy, was associated with improved survival, especially when the extent of viability exceeded 10% of the myocardium.

The viability substudy of the STICH trial found viable myocardium in 487 of 601 patients (81%) and no viable myocardium in 114 (19%). Among patients without viability, 60 were allocated to CABG and 54 to medical therapy and, among the 487 patients with myocardial viability, 244 were assigned to CABG and 243 to medical therapy. The differences in baseline characteristics, between patients who underwent myocardial viability testing and those who did not, indicate some selection bias driven by clinical factors.

2014 ESC/EACTS Guidelines on myocardial revascularization
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Viability was arbitrarily defined using different cut-off values for the different tests used. By univariate analysis, there was a significant association between myocardial viability and outcome; however, this association was not significant on multivariable analysis that included other prognostic variables. It is likely that other variables, such as LV volumes and ejection fraction, are causally determined by the extent of viable myocardium. The lack of correlation between myocardial viability status and benefit from CABG in this study indicates that assessment of myocardial viability should not be the sole factor in selecting the best therapy for these patients.

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The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

European Heart Journal (2014) 35, 2541-2619
# Myocardial viability and revascularization

## Recommendations on revascularizations in patients with chronic heart failure and systolic LV dysfunction (ejection fraction ≤35%)

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
<th>Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG is recommended for patients with significant LM stenosis and LM equivalent with proximal stenosis of both LAD and LCx arteries.</td>
<td>I</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>CABG is recommended for patients with significant LAD artery stenosis and multivessel disease to reduce death and hospitalization for cardiovascular causes.</td>
<td>I</td>
<td>B</td>
<td>112,288</td>
</tr>
<tr>
<td>LV aneurysmectomy during CABG should be considered in patients with a large LV aneurysm, if there is a risk of rupture, large thrombus formation or the aneurysm is the origin of arrhythmias.</td>
<td>IIa</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Myocardial revascularization should be considered in the presence of viable myocardium.</td>
<td>IIa</td>
<td>B</td>
<td>55</td>
</tr>
<tr>
<td>CABG with surgical ventricular restoration may be considered in patients with scarred LAD territory, especially if a post-operative LVESV index &lt;70 mL/m² can be predictably achieved.</td>
<td>IIb</td>
<td>B</td>
<td>291–295</td>
</tr>
<tr>
<td>PCI may be considered if anatomy is suitable, in the presence of viable myocardium, and surgery is not indicated.</td>
<td>IIb</td>
<td>C</td>
<td>-</td>
</tr>
</tbody>
</table>

CABG = coronary artery bypass grafting; LAD = left anterior descending; LCx = left circumflex; LM = left main; LVESV = left ventricular end-systolic volume; PCI = percutaneous coronary intervention; SVR = surgical ventricular reconstruction.

aClass of recommendation.
bLevel of evidence.
cReferences.

Όλυμπος – Οροπέδιο Μουσών