Myocardial perfusion imaging in multivessel disease

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Multivessel disease is not rare in patients with acute myocardial infarction (MI), with a prevalence up to 30% in ST-segment elevation MI (STEMI). Also, the presence of multivessel disease is associated with a higher risk of major adverse cardiac event (MACE).

Recent randomized clinical trials have sought to evaluate whether multivessel disease should be revascularized in the setting of STEMI. They showed consistent benefits from staged, multivessel revascularization as compared to culprit-only revascularization. Also, a recent meta-analysis showed a lower risk of MACE for complete revascularization. These results have changed major guidelines including ESC/EACTS and ACCF/AHA/SCAI guidelines. Traditionally, the guidelines' recommendations were against revascularization of non-culprit arteries. But they have changed the recommendation classes towards benefit based on the clinical trials mentioned above.

However, the selection of non-culprit arteries to be revascularized still remains undetermined. Notably, DANAMI-3-PRIMULTI trial showed that staged, ischemia-guided (via fractional flow reserve; FFR) revascularization could be a reasonable treatment strategy. With regards to the trial, nuclear myocardial perfusion imaging (MPI) can be a non-invasive alternative for invasive coronary angiography (CAG) for the measurement of FFR. MPI can evaluate the perfusion status of non-culprit arteries as well as the burdens of recent infarct and residual ischemia after culprit revascularization. Also, it can evaluate the presence of decreased cardiac function and can guide appropriate treatment for ischemic heart failure. In addition, Functional assessment including that of left ventricular dyssynchrony by MPI can be important for risk stratification according to recent studies. MPI can be a complimentary tool in patients with acute STEMI with multivessel disease.