Ischemic Mitral Regurgitation After Acute Myocardial Infarction in the Percutaneous Coronary Intervention Era

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Ischemic mitral regurgitation (IMR) is a term used to denote MR (mitral regurgitation) that occurs secondary to ischemic heart disease. Although transient ischemia can provoke IMR that is reversible with relief of ischemia, the most common form of IMR in clinical practice is associated with chronic ischemic cardiomyopathy. In such patients, global or regional left ventricular (LV) remodeling leads to a combination of leaflet tethering, reduced LV closing force, and annular dilation. LV dyssynchrony may also play a role when there is left bundle branch block. It has been demonstrated in multiple studies that IMR is associated with a poor prognosis in ischemic cardiomyopathy. Importantly, the initiating event that leads to ischemic cardiomyopathy is usually a first myocardial infarction (MI). Lamas et al reported that IMR in the setting of acute MI was associated with adverse prognosis SAVE trial (Survival And Ventricular Enlargement). Subsequently, Grigioni et al reported the effect of IMR on prognosis in the late phase post MI. However, those trials were performed before the routine use of acute percutaneous coronary intervention (PCI) as treatment of acute MI.

The authors report that incidence of IMR per culprit coronary vessel was not statistically different. Although clinical experience suggests that IMR is more likely with infero-posterior or lateral MI, the literature has been controversial, perhaps because of unequal distribution of patients included in different studies. In some trials, patients with MR were more likely to have sustained an anterior MI, but in other investigations, an inferior MI, a posterolateral MI, a combined anterior–inferior, or an MI of indeterminate location were predominant. Moreover, the definition of chronicity after MI varies widely, with cutoffs going from 16 days to 1 month to 6 to 8 months. Although in the long term after MI, scar tissue and LV remodeling with distortion of the mitral valve apparatus play a big role in pathogenesis of IMR, in the acute phase of MI, MR may preexist or result from acute, but potentially reversible, regional LV dilation and loss of contraction. Most studies have shown that functional MR in early MI is associated with a worse prognosis and is an important, independent predictor of cardiovascular mortality. The article by Nishino et al corroborates this data, showing that IMR on arrival and persistent IMR in the chronic phase worsened short-term and long-term prognosis after acute myocardial infarction, respectively. Although they found that IMR was related to LV volume, data on regional wall motion abnormalities,
LV regional dys synchrony, presence of posterior aneurysm, mitral annular diameter, and global longitudinal strain were not reported, nor did they comment on new left bundle branch block after MI. Cardiac resynchronization therapy (CRT) has been shown, indeed, to reduce the degree of MR in chronic left bundle branch block by inducing LV reverse remodeling and increasing the force of contraction. Because delayed posterolateral wall contraction is characteristic of left bundle branch block, CRT may also reduce coordinate papillary muscle contraction early post MI, thereby reducing MR. Persistent or recurrent MR after CRT has been shown to portend worsen prognosis, with less reverse remodeling and higher clinical events rate. Unfortunately, there is no evidence regarding the early use of CRT in a post-MI setting. Moreover, more aggressive treatment of ischemic functional MR by surgical or percutaneous repair or replacement has not been proven to be effective at improving prognosis. Current American College of Cardiology/American Heart Association guidelines for the management of valvular heart disease list a Class IIb indication for mitral valve repair in patients with chronic severe MR secondary MR because of severe LV dysfunction (ejection fraction <30%) who have persistent symptoms despite optimal medical therapy and CRT when indicated. The European guidelines have, instead, a Class IC indication for surgery in patients with severe MR and LV ejection fraction >30% undergoing coronary artery bypass grafting, even though retrospective analyses using propensity score matching showed no survival benefit of adding mitral valve repair to coronary artery bypass grafting. In the STICH trial (Surgical Treatment for Ischemic Heart Failure), survival in the medically treated cohort (with high use of guideline-directed medical therapy) depended strongly on MR grade at baseline, with mortality hazard doubled in patients with moderate to severe MR compared with patients with no MR. In patients with moderate to severe MR, adding mitral valve repair to coronary artery bypass grafting tended to improve survival compared with coronary artery bypass grafting alone or medical therapy alone. However, the decision to repair the valve was not randomized. Therefore, although it is very clear that any degree of MR confers an adverse prognosis, it remains unclear whether surgical or percutaneous correction of MR shifts a patient from an adverse survival curve to a more favorable one. Results of randomized clinical trials, such as the COAPT trial (Cardiovascular Outcomes Assessment of the MitraClip Percutaneous Therapy for Heart Failure Patients with Functional Mitral Regurgitation), will provide an answer to this critical question. Until then, it remains uncertain whether MR is mainly a marker for worse LV function (and hence survival) or a target for therapy.

Disclosures

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References


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