Editorial Comment
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Contribution of Echocardiography on Evaluation of Ventricular Remodeling after Myocardial Infarction

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In the natural history of Coronary Artery Disease, it is observed that after an acute myocardial infarction, survivors tend to suffer left ventricular remodeling and subsequently they develop heart failure[1]. It is observed that the most frequent cause of heart failure is coronary artery disease, accounting for approximately two thirds of cases[2]. Left ventricular remodeling is defined as a process by which the heart changes its geometry, size, and function over time; it can be physiological (as in physical training or during pregnancy) or pathological (in valve heart disease, cardiomyopathies, arterial hypertension, and myocardial infarction).

Remodeling that occurs after AMI has its peculiarities because it is an acute process with sudden loss of contractile myocytes. The early expansion of the infarction area is associated with subsequent dilatation of the left ventricle, since the increased local parietal stress is redistributed to maintain the ejection volume[3]. The extent of early and late remodeling after AMI is determined by several factors such as the size and location of the infarction, activation of sympathetic nervous system, regulation of Renin-Angiotensin-Aldosterone system, and the action of natriuretic peptides. 30 to 50% of post-AMI patients suffer progressive dilatation with distortion in ventricular geometry and secondary mitral regurgitation. Mitral regurgitation further increases the trend to deterioration of ventricular function and development of heart failure[4].

The conventional echocardiographic measures recommended by the *American Society of Echocardiography* for evaluation and monitoring of LV remodeling include estimates of LV volumes, ejection fraction, LV mass, and description of the left ventricle shape[4], all these parameters associated predominantly with LV systolic function.

Diastolic dysfunction is well established as the cause of heart failure and powerful prognostic indicator of cardiovascular events, and the Doppler echocardiography has been the most used tool in its study[5]. Among the parameters used with the aim of assessing diastolic function, increased attention has been given to filling pressures of the left ventricle, these being estimated mainly by the E/e' ratio (ratio between E velocity of mitral diastolic flow and the e' velocity of tissue Doppler).

For 15 years the authors have studied the contribution of tissue Doppler, mainly by the E / e' ratio, in the investigation of left ventricular filling pressures[6]. Kasneret et al[7], in 2007, evaluating several echocardiographic indexes in patients simultaneously studied with conductance catheter, concluded that E/e' ratio was the best index to detect diastolic dysfunction in patients with heart failure and normal ejection fraction[7]. However, when studying patients with advanced systolic heart failure, Mullenset et al.[8] indicated that this index would not be appropriate to estimate the filling pressures in unbalanced patients, mainly with large ventricular volumes and reduced cardiac indexes[8].

The application of the E/e' ratio has also been studied in patients with acute myocardial infarction, evidencing prognostic implications correlated with survival[9] and the occurrence of dilation after myocardial infarction[10].

In this issue of the *Brazilian Journal of Cardiovascular Imaging and Echocardiography,* Barberato et al.[11], elegantly address the contribution of the E/e' ratio to predict the left ventricular remodeling after acute myocardial infarction. The 55 consecutive patients had suffered their first myocardial infarction and all underwent coronary angioplasty followed by effective rechanneling. Doppler echocardiography was performed within 48 hours following the angioplasty, and 60 days after the infarction. The patients who developed remodeling had higher levels of markers for myocardial necrosis, worse functional class *(Killip)*, lower ejection fraction, and higher prevalence of arterial hypertension, but the E/e' ratio was the only independent predictor of remodeling.

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Therefore, it is characterized another important application of E/e' ratio in clinical practice, indicating remarkable prognostic contribution in the management of Acute Myocardial Infarction. Since the cohort included patients with first myocardial infarction with ventricular dimensions within the normal range and modest reductions in LV systolic function, it remains to be clarified whether the information provided by the E/e' ratio would apply also to more severe cases, with greater functional impairment, in which the previous study[8] reported lower contribution of this parameter.

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