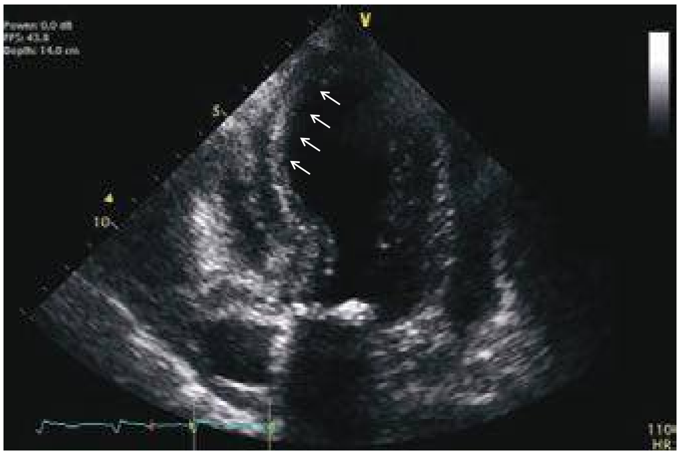

FIGURE 270e-25 Acute left anterior descending artery distribution myocardial infarction at end systole showing akinetic region (*arrows*).

Some patients demonstrate progressive left ventricular dilatation and dysfunction, known as cardiac remodeling, after myocardial infarction. Assessment of cardiac function and regional wall motion is useful in the follow-up period, generally between 1 and 6 months following infarction. The persistence of left ventricular systolic dysfunction following infarction is used to determine the type of therapy (e.g., angiotensin-converting enzyme inhibitors or angiotensin receptor blockers are typically used in patients with systolic dysfunction following myocardial infarction).

In patients with acute or subacute myocardial infarction, investigation of residual ischemia and/or viability is occasionally an important clinical question, especially among those with recurrent symptoms after myocardial infarction (Fig. 270e-26). All cardiac imaging techniques can provide information regarding myocardial viability and ischemia. In the absence of definitive trials offering head-to-head comparisons between techniques in large series of patients, uncertainty persists concerning the relative accuracies of each method for predicting functional and prognostic benefit after revascularization. Thus, one should exercise caution in the interpretation of the relative diagnostic accuracy of each imaging technology. Nevertheless, the available data suggest that radionuclide imaging, especially PET, is highly sensitive, with higher negative predictive value than dobutamine echocardiography. In contrast, dobutamine echocardiography tends to be associated with higher specificity and positive predictive accuracy than the radionuclide imaging methods. The experience with CMR suggests that it offers similar predictive accuracies as those seen with dobutamine echocardiography.

Role of Imaging in New-Onset Heart Failure Echocardiography is usually a first-line test in patients presenting with new-onset heart failure. As discussed above, this test provides a direct assessment of ventricular function and can help distinguish patients with reduced ejection fraction from those with preserved ejection fraction. In addition, it provides additional structural information including an assessment of valves, myocardium, and pericardium.

Although coronary angiography is commonly performed in patients with reduced ejection fraction, the determination of heart failure etiology in an individual patient may be difficult even if angiographically obstructive CAD is present. Indeed, patients with heart failure and no angiographic CAD may have typical angina or regional wall motion abnormalities on noninvasive imaging, whereas patients with angiographically obstructive CAD may have no symptoms of angina

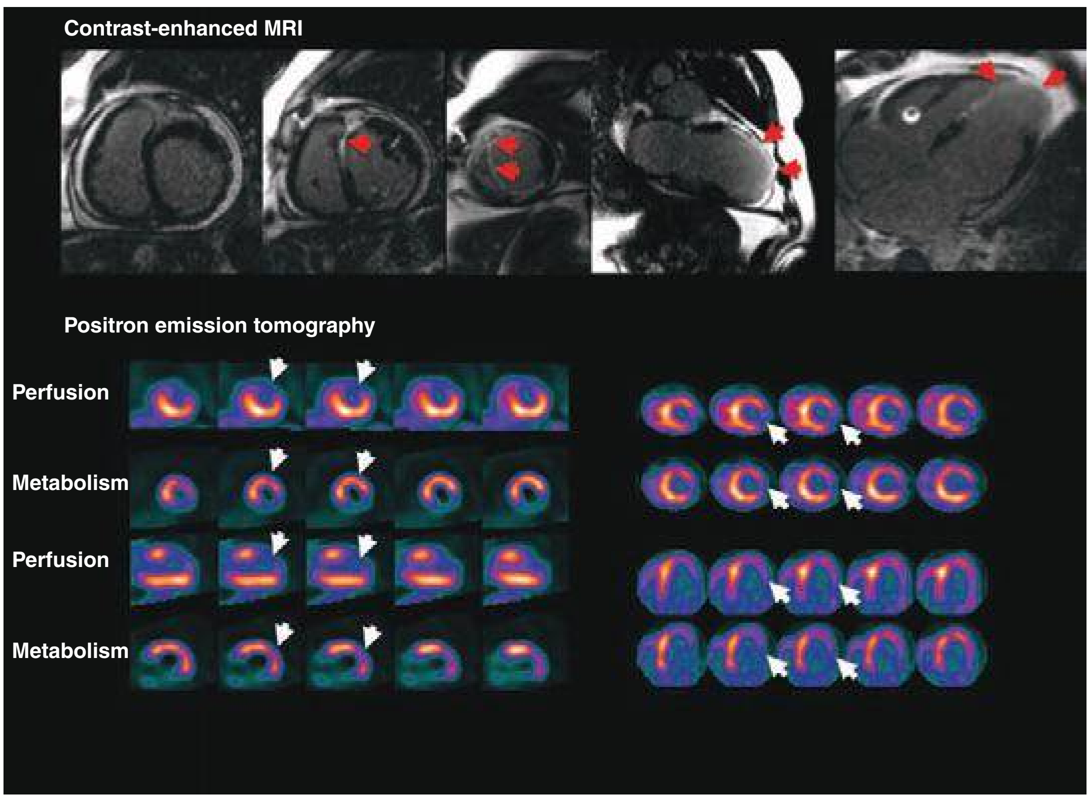

FIGURE 270e-26 Examples of myocardial viability patterns obtained with cardiac magnetic resonance imaging (MRI) and positron emission tomography (PET) in three different patients with coronary artery disease. The *top panel* demonstrates extensive late gadolinium enhancement (bright white areas) involving the anterior, anteroseptal, and apical left ventricular walls (*arrows*), consistent with myocardial scar and nonviable myocardium. The *lower left panel* demonstrates rubidium-82 myocardial perfusion and ^{18}F-fluorodeoxyglucose (FDG) images showing a large and severe perfusion defect in the anterior, anterolateral, and apical walls, indicating preserved glucose metabolism (so-called *perfusion-metabolic mismatch*) consistent with viable myocardium. The *right lower panel* shows similar PET images demonstrating concordant reduction in perfusion and metabolism (so called *perfusion-metabolic match*) in the lateral wall, consistent with nonviable myocardium.