A 69-year-old man presented to his local physician with progressive dyspnea on exertion and a chest radiograph showing pulmonary edema. He denied any anginal symptoms, but on coronary angiography, he had severe obstructive coronary artery disease involving all 3 major arteries. The left ventricular ejection fraction by multigated angiogram (MUGA) was 22%, with global hypokinesis. A subsequent PET scan showed a large “flow-metabolism” mismatch involving the anterior and anterolateral walls (Figure). The patient underwent an uneventful 3-vessel bypass operation, and within 3 months, he returned to work as a truck driver hauling wood. Although his follow-up MUGA ejection fraction is only mildly increased, to 25%, his functional class has improved markedly, with minimal symptoms on exertion.

By use of dual PET tracers, viable but ischemic myocardium can be identified on the basis of decreased perfusion and a relative increase in glucose uptake.1,2 This is called a “flow-metabolism” mismatch, and its presence is an important prognostic factor in individuals with severe left ventricular dysfunction and 3-vessel disease. Although the risk of bypass surgery is increased in these individuals, the high mortality of these patients given medical therapy may warrant an aggressive attempt to revascularize the coronary arteries.3,4

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References


Images of myocardial blood flow (MBF) with $^{13}$Nammonia are compared with $^{18}$Ffluorodeoxyglucose (FDG) from base to apex in same transverse projections. In anterolateral wall, blood flow is decreased in same regions in which FDG uptake is increased. This pattern has been called a “flow-metabolism mismatch” and is diagnostic of viable but ischemic myocardium.
Flow-Metabolism Mismatch and Severe Ischemic Cardiomyopathy
Edward O. McFalls and Herbert B. Ward

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