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Non-Invasive Evaluation of Patients After Percutaneous Coronary Revascularization. The Role of Cardiac Imaging

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Abstract : Numerous study have shown the efficacy of the percutaneous intervention (PCI) and coronary stenting in improving left ventricular function and relieving exertional angina. Furthermore, PCI remains the main line of therapy in acute myocardial infarction. Improvement of procedural techniques and new devices have resulted in an increased number of PCI in those with difficult and extensive lesions, multivessel disease as well as total occlusion. Immediate and late outcome may be compromised by acute thrombosis or the development of fibro-intimal hyperplasia. In addition, progression of coronary artery disease proximal or distal to the stent as well as in non-stented arteries is not uncommon. As a result, complications can occur, such as acute myocardial infarction, worsened heart failure or recurrence of angina. In a stent, restenosis can occur without symptoms or with atypical complaints rendering the clinical diagnosis difficult. Routine invasive angiography is not appropriate as a follow up tool due to associated risk and cost and the limited functional assessment. Exercise and pharmacologic stress testing are increasingly used to evaluate the myocardial function, perfusion and adequacy of revascularization. Information obtained by these techniques provide important clues regarding presence and severity of compromise in myocardial blood flow. Stress echocardiography can be performed in conjunction with exercise or dobutamine infusion. The diagnostic accuracy has been moderate, but the results provide excellent prognostic stratification. Adding myocardial contrast agents can improve imaging quality and allows assessment of both function and perfusion. Stress radionuclide myocardial perfusion imaging is an alternative to evaluate these patients. The extent and severity of wall motion and perfusion abnormalities observed during exercise or pharmacologic stress are predictors of survival and risk of cardiac events. According to current guidelines, stress echocardiography and radionuclide imaging are considered to have appropriate indication among patients after PCI who have cardiac symptoms and those who underwent incomplete revascularization. Stress testing is not recommended in asymptomatic patients, particularly early after revascularization, Coronary CT angiography is increasingly used and provides high sensitive for the diagnosis of coronary artery stenosis. Average sensitivity and specificity for the diagnosis of in stent stenosis in pooled data are 79% and 81%, respectively. Limitations include blooming artifacts and low feasibility in patients with small stents or thick struts. Anatomical and functional cardiac imaging modalities are corner stone for the assessment of patients after PCI and provide salient diagnostic and prognostic information. Current imaging techniques cans serve as gate keeper for coronary angiography, thus limiting the risk of invasive procedures to those who are likely to benefit from subsequent revascularization. The determination of which modality to apply requires careful identification of merits and limitation of each technique as well as the unique characteristic of each individual patient.

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