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Improvement of left ventricular systolic function after revascularization assessed by echocardiography and PET-CT in patients with coronary chronic total occlusions

Background: The present study aimed to study the improvement of left ventricular systolic function after revascularization in patients with CTOs assessed by echocardiography and electrocardiogram-gated 18F-FDG positron emission tomography/computed tomography (PET/CT) imaging. Methods: A prospective study of 115 consecutive CTO patients was included. Symptoms were assessed using the summary score, angina frequency score, physical limitation score and quality of life score of SAQ-7. Every patient received standard transthoracic echocardiogram, while 31 of them received electrocardiogram-gated 18F-FDG PET CT before and 9-12 months after percutaneous coronary intervention (PCI). Perfusion abnormity segments, ischemic area, viable myocardial area and LVEF were assessed by PET CT. Results: Rentrop grade 2&3 group had significantly smaller LVESd, LVEDd, larger LVEF by echocardiogram, compared with Rentrop grade 0&1 group. SAQ-7 summary score, angina frequency score, physical limitation score and quality of life score were significantly increased after intervention. LVEDd was slightly decreased (55.1±6.0mm vs. 54.6±5.7mm, P=0.048) and LVEF was slightly increased after intervention (55.6±6.5% vs. 56.2±5.2%, P=0.040) by echocardiogram. Perfusion abnormity segments (2.3±0.8 vs. 6.8±2.0, P=0.001), ischemic area (18.0±4.3% vs. 37.3±8.6%, P=0.001) were significantly decreased, while viable myocardial area (83.9±7.0% vs. 78.3±6.3%, P=0.001) and LVEF (43.3±4.9% vs. 39.4±5.6%, P=0.001) were significantly increased after intervention. Conclusions: This small group of patients showing that perfusion abnormity, ischemia, viable myocardial area and global left ventricular systolic function were significantly improved in coronary CTOs after successful revascularization. PET/CT is more accurate than echocardiogram in assessment of left ventricular systolic function.