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Titel des Beitrags:
Assessment of myocardial perfusion and viability by Positron Emission Tomography.

Abstract:
An important evolution has taken place recently in the field of cardiovascular Positron Emission Tomography (PET) imaging. Being originally a highly versatile research tool that has contributed significantly to advance our understanding of cardiovascular physiology and pathophysiology, PET has gradually been incorporated into the clinical cardiac imaging portfolio contributing to diagnosis and management of patients investigated for coronary artery disease (CAD). PET myocardial perfusion imaging (MPI) has an average sensitivity and specificity around 90% for the detection of angiographically significant CAD and it is also a very accurate technique for prognostication of patients with suspected or known CAD. In clinical practice, Rubidium-82 ((82)Rb) is the most widely used radiopharmaceutical for MPI that affords also accurate and reproducible quantification in absolute terms (ml/min/g) comparable to that obtained by cyclotron produced tracers such as Nitrogen-13 ammonia ((13)N-ammonia) and Oxygen-15 labeled water ((15)O-water). Quantification increases sensitivity for detection of multivessel CAD and it may also be helpful for detection of early stages of atherosclerosis or microvascular dysfunction. PET imaging combining perfusion with myocardial metabolism using (18)F-Fluorodeoxyglucose ((18)F FDG), a glucose analog, is an accurate standard for assessment of
myocardial hibernation and risk stratification of patients with left ventricular dysfunction of ischemic etiology. It is helpful for guiding management decisions regarding revascularization or medical treatment and predicting improvement of symptoms, exercise capacity and quality of life post-revascularization. The strengths of PET can be increased further with the introduction of hybrid scanners, which combine PET with computed tomography (PET/CT) or with magnetic resonance imaging (PET/MRI) offering integrated morphological, biological and physiological information and hence, comprehensive evaluation of the consequences of atherosclerosis in the coronary arteries and the myocardium.

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