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PET/MR as translational tool in cardiology

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Multimodality imaging has become an attractive tool of cardiovascular imaging, delineating cardiac structures with high spatial resolution combined with specific metabolic and molecular information provided by tracer techniques. PET/CT offers the opportunity of non-invasive coronary angiography and myocardial perfusion imaging, linking anatomic definition of coronary stenosis with the functional consequences of reduced regional myocardial perfusion reserve. In addition, marker of perfusion and viability can be combined to delineate not only perfusion but also the metabolic activity as a biomarker for tissue viability in patients with advanced left ventricular dysfunction. More recently, new specific tracers have emerged to visualize autonomic innervation as a prognostic marker in patients with heart failure as well as to identify inflammatory changes occurring in the vascular tree. Especially, the use of F-18 fluoride has gained acceptance as a specific marker of early plaque development. The increasing number of molecular tracers targeting specific biological processes will help to promote multimodal imaging as an important translational tool not only to describe early changes occurring in cardiovascular disease but also to monitor therapeutic interventions.

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