Advances in PET myocardial perfusion imaging: F-18 labeled tracers.

Abstract:
Coronary artery disease and its related cardiac disorders represent the most common cause of death in the USA and Western world. Despite advancements in treatment and accompanying improvements in outcome with current diagnostic and therapeutic modalities, it is the correct assignment of these diagnostic techniques and treatment options which are crucial. From a diagnostic standpoint, SPECT myocardial perfusion imaging (MPI) using traditional radiotracers like thallium-201 chloride, Tc-99m sestamibi or Tc-99m tetrofosmin is the most utilized imaging technique. However, PET MPI using N-13 ammonia, rubidium-82 chloride or O-15 water is increasing in availability and usage as a result of the growing number of medical centers with new-generation PET/CT systems taking advantage of the superior imaging properties of PET over SPECT. The routine clinical use of PET MPI is still limited, in part because of the short half-life of conventional PET MPI tracers. The disadvantages of these conventional PET tracers include expensive onsite production and inconvenient on-scanner tracer administration making them unsuitable for physical exercise stress imaging. Recently, two F-18 labeled radiotracers with longer radioactive half-lives than conventional PET imaging agents have been introduced. These are flurpiridaz F 18 (formerly known as F-18 BMS747158-02) and F-18
fluorobenzyltriphenylphosphonium. These longer half-life F-18 labeled perfusion tracers can overcome the production and protocol limitations of currently used radiotracers for PET MPI.