

## SEEING BEYOND SCAR: THE ROLE OF MPI AND PET IN IDENTIFYING VIABLE MYOCARDIUM

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**Background:** Myocardial perfusion imaging (MPI) is a well-established non-invasive modality for assessing myocardial blood flow, identifying ischemia, and guiding management in coronary artery disease (CAD). However, differentiating scarred myocardium from viable but dysfunctional (hibernating) tissue remains a clinical challenge. The addition of cardiac positron emission tomography (PET) with <sup>18</sup>F-FDG allows metabolic characterization, improving the identification of viable myocardium that may benefit from revascularization. MPI has been routinely performed since 2004 using a one-day stress-rest protocol with Tc-99m sestamibi at National Institute of Nuclear Medicine and Allied Sciences (NINMAS) whereas cardiac PET with <sup>18</sup>F-FDG was introduced in 2019 for viability assessment. **Methods:** This retrospective observational study was conducted at NINMAS. Gated SPECT rest MPI or Gated SPECT stress-rest MPI was done to detect area of hypoperfusion or wall motion abnormality. PET cardiac imaging with <sup>18</sup>F-FDG was done after good patient preparation according to American Society of Nuclear Cardiology (ASNC) imaging guideline. Total of 80 patients with known or suspected CAD who underwent both MPI and PET were included. Imaging findings were categorized into viable, non-viable, and mixed (partially viable) patterns based on perfusion-metabolism mismatch analysis. **Results:** Among the 80 patients, 56% (n=45) demonstrated a mixed pattern, indicating partial viability with areas of both scar and hibernating myocardium. Purely viable myocardium was identified in 20% (n=16) of patients, while the remaining 24% (n=19) showed non-viable scar tissue. The integration of PET findings with MPI improved diagnostic confidence in viability assessment and influenced clinical decision-making regarding revascularization. **Conclusion:** The combined use of MPI and cardiac PET significantly enhances the detection of viable myocardium. This integrated approach supports better patient selection for revascularization, helping to avoid unnecessary interventions while optimizing clinical outcomes.

**Keywords:** Myocardial perfusion imaging (MPI), Cardiac PET (<sup>18</sup>F-FDG), Myocardial viability

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