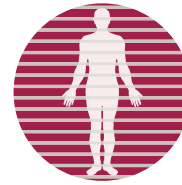


The Role of Myocardial Perfusion Imaging



SKG
RADIOLOGY

MyoCardial perfusion scintigraphy (MPS) is a non-invasive imaging modality useful in the evaluation of patients with suspected or known coronary disease. MPS has a robust evidence base with extensive literature documenting its value as a diagnostic tool.

Background

MPS shows the distribution of radiopharmaceuticals which are rapidly extracted from the coronary artery blood into the myocardium proportional to blood flow. Thallium and Sestamibi are the most commonly used radiopharmaceuticals. Imaging is performed at rest and at stress. If the patient is able to exercise an exercise ECG stress is performed either on a bike or treadmill with the radiopharmaceutical injected at peak stress. If the patient is unable to exercise pharmacological stress testing is performed with dipyridamole being the most commonly used agent.

MPS is able to assess:

- Myocardial perfusion – measure and quantify the extent, severity and reversibility of ischaemia.
- Left ventricular wall motion and thickening.
- Cardiac volumes and left ventricular ejection fraction (LVEF).

Clinical indications for MPS:

- Diagnosis or exclusion of coronary artery disease (CAD) in patients who are clinically at intermediate risk. For patients with a low pretest likelihood of CAD the frequency of MPS abnormalities is low.
- To diagnose or exclude CAD in patients at low risk who have an abnormal or inconclusive exercise stress ECG.
- To diagnose CAD in patients presenting to the emergency department with chest pain and a normal or inconclusive ECG ('Hot MIBI' scan)
- Risk stratification to help determine prognosis and guide management. This is useful in patients with a high pre-test likelihood of CAD including the elderly and diabetics. A normal MPS defines a low risk (<1% - which is the same as age matched asymptomatic controls) of an adverse cardiac event in the short term (1 to 2 years). Such

patients can be managed with risk modification where as patients with moderate to large reversible defects require more aggressive therapy.

- Determine the hemodynamic significance of borderline coronary stenosis in patients who have had conventional or CT angiography. In the setting of no or mild ischaemia patients undergoing medical therapy as the initial treatment have been shown to have survival rates superior to that of patients referred for revascularisation. Where moderate to severe ischaemia was detected by MPS, patients undergoing revascularisation have an increased survival benefit over patients undergoing medical therapy.
- To monitor medical therapy for CAD
- To assess cardiac risk in preoperative patients having major surgery who are at risk for CAD
- To assess myocardial viability in patients who have had a recent infarct.

Radiation dose

The amount of radiation used in MPS is similar to that given by other radiological tests:

Examination	Effective dose (mSv)
MPS.....	12 – 25
Cardiac CT.....	9 – 29
Coronary angiography.....	1.6 – 10.6
Coronary angioplasty.....	6.8 – 28.9

SKG Radiology performs myocardial perfusion scintigraphy at the St John of God Subiaco and Murdoch branches. The test does attract a Medicare rebate and can be referred by a General Practitioner.

References

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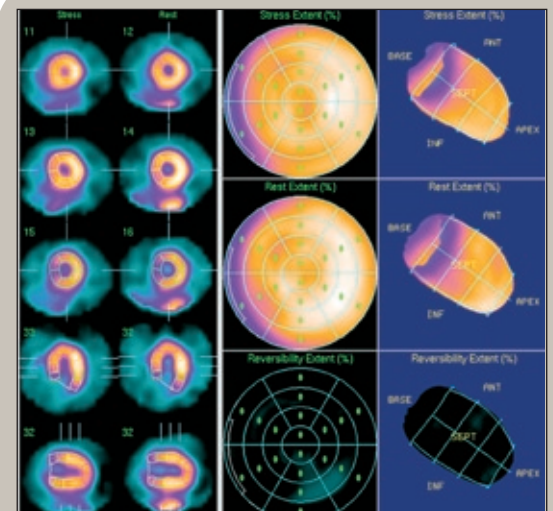


Fig 1. 61-year-old female with chest pain. Both the stress and rest studies were normal. The polar maps confirm no myocardial ischaemia.

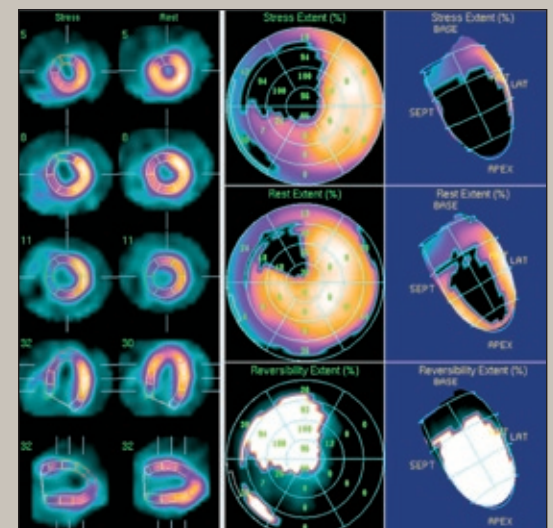


Fig 2. 64-year-old female with a history of ischaemic heart disease and chest pain on exertion. Perfusion study shows a large perfusion defect with reversible ischaemia at the apex, anterior and anteroseptal myocardium. Moderate fixed anteroseptal defect is in keeping with prior myocardial infarction.