



Viability Imaging – Cardiac MRI vs PET



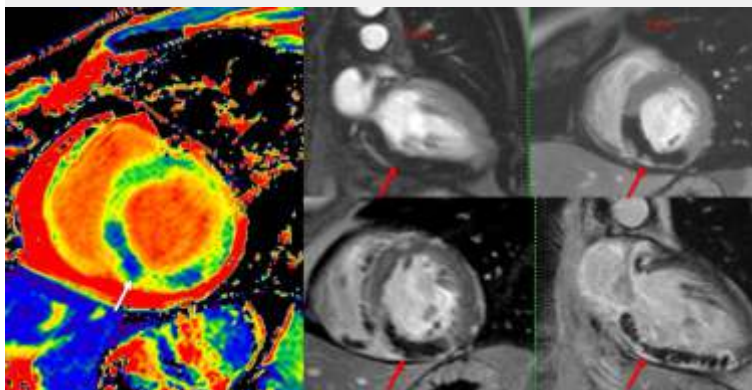
There are very few head-to-head studies, but a recent study has shown that dobutamine stress echo and SPECT are inferior to both cardiac MRI (CMR) and cardiac PET. Another meta-analysis in a nuclear medicine journal has shown that both CMR and cardiac PET are equivalent when it comes to answering the question of whether the myocardium subtended by a blocked coronary artery is viable or not.

The reason why CMR is superior to PET is because of the additional information it brings to the table.

1. Microvascular obstruction and intramyocardial hemorrhage (Fig. 1)
2. RV involvement (Fig. 2)
3. Papillary muscle rupture and acute mitral regurgitation (Fig. 3)
4. Aneurysms and ruptures (Figs 4, 5).
5. Thrombi (Fig. 5)

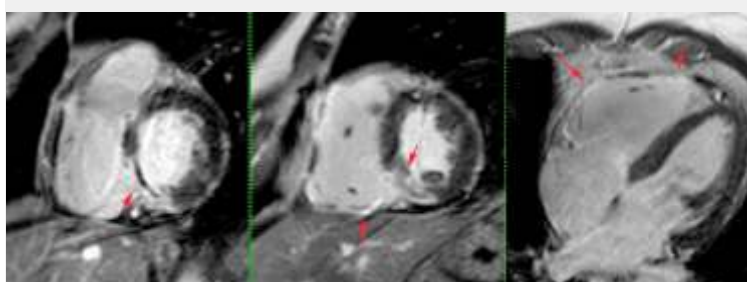
All this additional information comes at no extra cost or scan time.

Fig. 1: Intramyocardial hemorrhage.



Acute RCA territory infarct showing marked microvascular obstruction in the inferior wall (red arrows) on the early and delayed enhanced images with hemorrhage on the T1 map (blue color). This cannot be diagnosed by PET.

Fig. 2: RV involvement.



Acute RCA territory infarct. There is extensive involvement of the RV wall by infarction, which changes the prognosis significantly. PET cannot diagnose this.



At a glance

- ◆ CMR and PET are equivalent when it comes to answering the question of whether the myocardium supplied by a blocked vessel is viable or not
- ◆ CMR is a superior modality because of all the additional information it provides, from hemorrhage to ruptures, to papillary muscle involvement, RV involvement and thrombi.

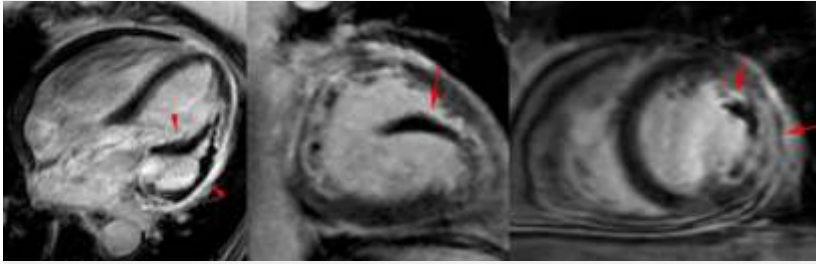


Fig. 3: Papillary muscle infarction. Acute LCx territory infarct. The red arrows show involvement of the anterolateral papillary muscle, which is infarcted, which then caused severe mitral regurgitation. This cannot be diagnosed on PET.

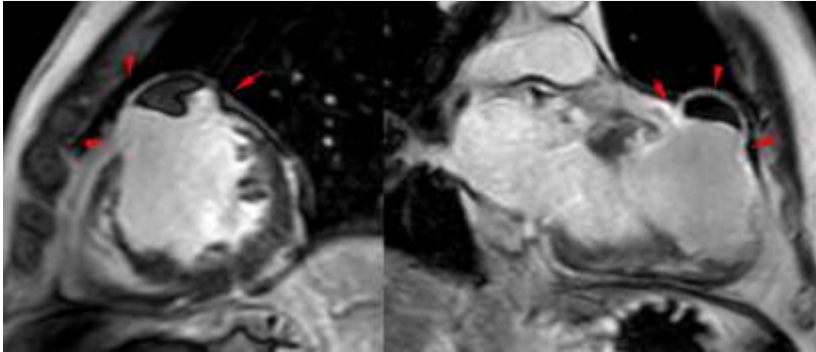


Fig. 4: Anterior wall pseudaneurysm due to contained rupture. Acute LAD territory infarct with a contained rupture and thrombus (arrows). PET may be able to pick up the contour abnormality, but not the pathology.

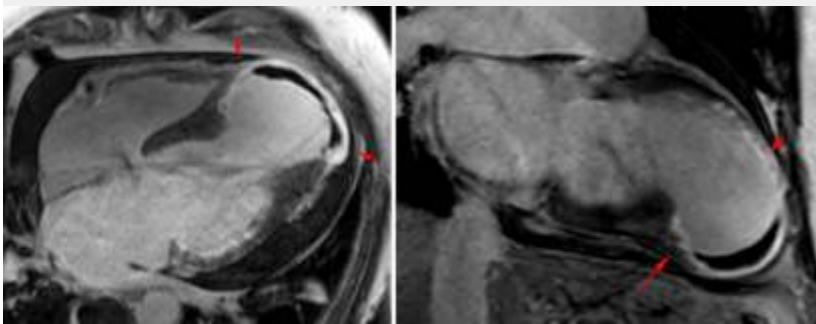


Fig. 5: Acute apical aneurysm and thrombus. Acute LAD territory infarct with apical aneurysm and thrombus. While the contour abnormality can perhaps be diagnosed on PET, the rest of the findings cannot.

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