Myocardial Viability by Cardiac MRI
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Clinical History
A 54-year-old man presented 5 days after the onset of chest pain with an anterior ST elevation myocardial infarction (MI). Cardiac catheterization revealed a sub-total occlusion of his mid left anterior descending (LAD) artery, and percutaneous intervention was deferred secondary to his late presentation. A resting thallium viability study was suggestive of residual viability of the mid anterior wall, but minimal viability of the apex. He was discharged on medical therapy. As part of a research study he underwent a cardiac MRI, which included a standard clinical MRI assessment of viability via late gadolinium enhancement (LGE).

Findings
Cardiac MRI revealed severe hypokinesis to akinesis of the mid anterior, mid antero-septum and all four apical segments. Quantitative left ventricular ejection fraction (LVEF) was 43% by Simpson's method. There was myocardial edema on T2 imaging and LGE in a sub-endocardial distribution typical of a recent myocardial infarction. The transmural extent of LGE was 50-75%, involving the mid-LAD territory, suggestive of minimal residual viability.

Discussion
The identification of viable myocardium following an MI has important implications with regard to potential benefits following revascularization. There are several imaging modalities available for the assessment of viability, including thallium rest and redistribution, PET-FDG imaging, and stress echocardiography. Cardiac MRI offers superior spatial resolution and has emerged as the gold standard for the quantification of myocardial scar via LGE. The recently published sub-study of STICH trial suggested that the presence of viability via SPECT imaging or echocardiography was associated with survival but did not predict benefit from coronary artery bypass graft compared with medical therapy alone in patients with severe LV dysfunction.

In the setting of complex coronary disease and concomitant LV dysfunction, a viability assessment via cardiac MRI can provide important diagnostic and prognostic information. In our patient, these findings were reviewed with his clinician in the context of possible revascularization, and the decision was made to continue with medical management.

REFERENCES