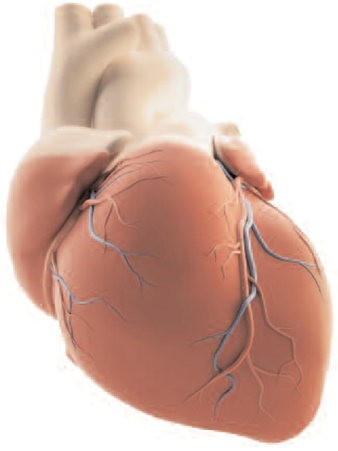
Magnetic Resonance Imaging

Cardiac MRI assists cardiologists and cardiac surgeons in the management of a large spectrum of diseases, without using ionizing radiation.

This includes:

- Coronary artery disease in the assessment of viable myocardium prior to revascularization
- Heart valve disease
- Cardiomyopathy and heart failure
- Congenital heart and vascular defects
- Pericardial disease
- Cardiac tumors



The Role of Cardiac MRI in Coronary Artery Bypass Grafting

Case studies are prepared periodically for your review in an effort to better assist you in understanding the types of patients we care for at St. Peter's Health Partners. Please call us with any questions regarding patients in your care who are presenting with similar symptoms or symptoms that require immediate attention.

Case Study

A 55 year-old male was admitted to the hospital with an episode of congestive heart failure. He reported progressive dyspnea on exertion and occasional chest pain for the last few months. He was in atrial fibrillation and cardiac catheterization revealed ischemic cardiomyopathy due to severe three-vessel coronary artery disease. His ejection fraction by echo was 15%.

After thorough evaluation and discussion, he underwent myocardial viability assessment with cardiac MRI. The MRI revealed viability in the vast majority of the myocardium in the presence of a severely depressed ejection fraction, indicating extensive hibernation.

The patient underwent successful coronary artery bypass grafting times six with left ventricular assist device backup. His hospital course was uneventful.

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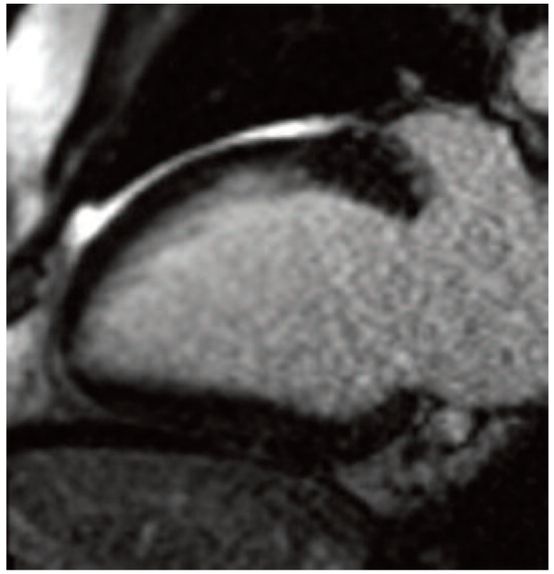
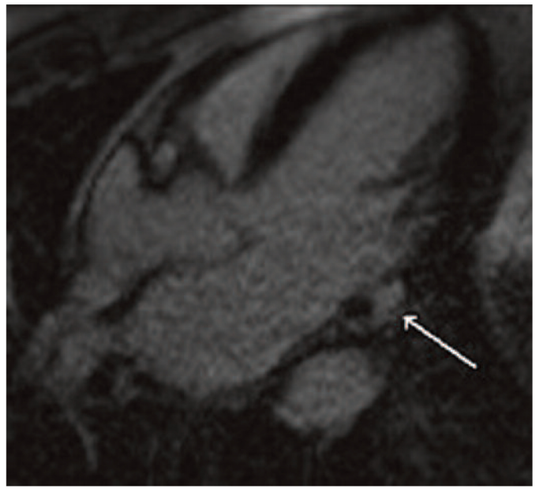


(Above) Late gadolinium enhancement (LGE) images revealed extensive hibernating myocardium with high likelihood of functional recovery.

(Below) LGE images demonstrated only a very small focal transmural infarct of the basilar inferolateral wall (White Arrow).



Discussion

This case illustrates the value of the cardiac MRI in the assessment of patients with cardiac disease.

In this patient, the MRI provided strong evidence that the myocardium was viable and that the patient would recover significant function with coronary artery bypass grafting.

Thorough evaluation of high-risk patients allows such patients to undergo coronary artery bypass grafting with left ventricular assist device (LVAD) backup to provide a greater margin of safety and ensure a smooth recovery.

Cardiac MRI is the most sensitive and specific tool for the assessment of myocardial viability. The objective is to determine the likelihood of functional recovery following revascularization in patients with ischemic cardiomyopathy.

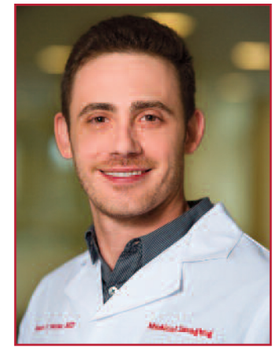
Viability assessment evaluates left ventricular function and wall motion in combination with late gadolinium enhancement (LGE) images to determine the presence and extent of infarct or scar.

Noninfarcted myocardium appears black on LGE images. Abnormal, infarcted myocardium appears white.

This technique allows us to visualize both normal and abnormal myocardium, and determine how much of the LV myocardium is infarcted.

Dysfunctional myocardium with infarct involving less than 50% of myocardial thickness has a high probability of functional recovery, whereas infarct involving greater than 50% of myocardial thickness has a low probability of functional recovery.

At St. Peter's, we provide a comprehensive evaluation and treatment of patients using state-of-the-art technology and expertise. We work with physicians and hospitals to ensure that all patients in the area have access to superior cardiac care.



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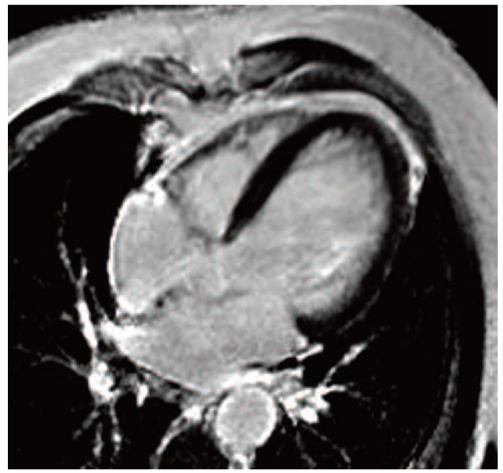

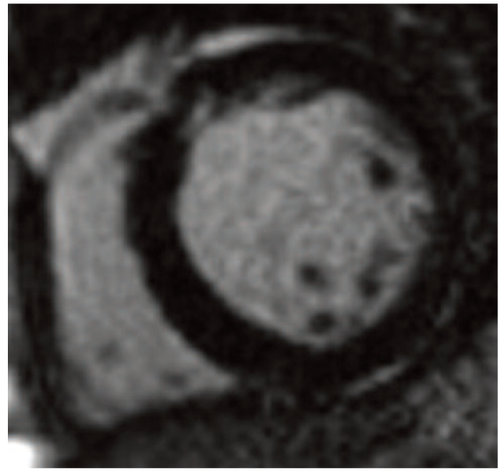

(Above) Dysfunctional myocardium with a normal (black) appearance on LGE images indicates a high probability of functional recovery following revascularization.