Myocardial infarction: optimization of delay time at delayed contrast-enhanced MR imaging at 3T

X. Y. Wang[1], W. Sun[2], X. X. Jiang[3]

[1]Radiology department, Peking University First Hospital, BeiJing, China, People's Republic of, [2]GE healthcare, Beijing, China, People's Republic of, [3]Peking University First Hospital, Beijing, China, People's Republic of

PURPOSE:

To find the optimum delay time in contrast enhancement viability examination at 3T.

MATERIALS AND METHODS:

First-pass myocardial perfusion imaging and delay enhancement examination were performed on 15 patients diagnosed as ischemic cardiac disease clinically (age 51-66yrs, mean 59.2yrs, 8 male and 2 female) at 3T with an 8 channel cardiac coil. Subjects received 0.1 mmol/kg for first-pass perfusion and after the perfusion imaging an additional 0.05mmol/kg Gd-DTPA were injected. Immediately after the administration of the contrast media, 2D short-axis myocardial delayed enhancement examination were performed with a FGRE sequence using the following parameters: TR 6.0-6.8ms, TE 2.9-3.3 ms, TI 185-320ms, receive bandwidth 31.3kHz, FOV 35*28cm, slice thickness 8.0-10.0mm, slice space 2.0-5.0mm, matrix 256*160, NEX 1. The sequence were repeated every 2 minutes until 15 minutes after the injection of Gd-DTPA and TI values were adjusted according to the image quality. The signal intensities of the enhanced area, nonenhanced cardiac muscle and background were measured.

RESULTS:

All the patients obtained good quality images. Optimal TI was 185-320ms form immediately contrast injection to 15 minutes after administration of 0.15 mmol/kg Gd-DTPA. Overall 19 enhanced lesions were detected. At optimal TI, relative signal intensity of infarcted myocardium compared with uninfarcted myocardium was maximal (mean +/- standard deviation, 366.8% +/- 120.1) at 2 minutes, whereas signal-to-noise ratio of uninfarcted myocardium was minimal (19.6 +/- 11.2) at 2 minutes. But with unappropriate TI, there were no obvious time point that better than the others.

CONCLUSION:

For viability examination at 3T, 2 minutes may be the suitable time to acquire the images. But the optimization of TI may be more important than the time issue.

KEY WORDS:
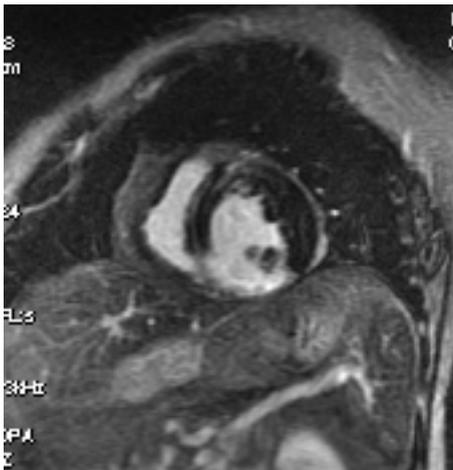
Myocardium; Viability; Magnetic resonance imaging
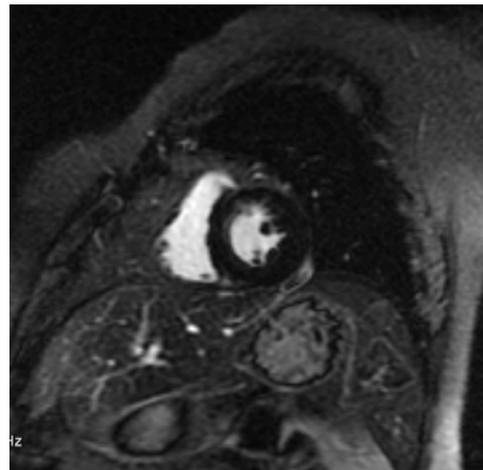
Fig 1

Fig 2

Fig 1 demonstrated the inferior wall enhancement in a patient with chronic infarction.

Fig 2 demonstrated the null normal myocardium of a patient.