

## T2-Weighted MR Imaging of the Liver: Evaluation of the Effect in Signal Intensity After Gd-EOB-DTPA Enhancement

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**Purpose.** Gadolinium ethoxybenzyl diethylenetriaminepentaacetic acid (Gd-EOB-DTPA) is a more recently developed liver-specific MR imaging contrast agent. The optimal timing for the hepatobiliary phase images acquired after Gd-EOB-DTPA administration is about 20 minutes. In order to shorten the MR examination time using Gd-EOB-DTPA, it may be reasonable to perform T2-weighted MR sequences such as fast spin-echo (FSE) sequence between dynamic series and hepatobiliary phase imaging after contrast agent administration. The aim of this study was to evaluate the effect of Gd-EOB-DTPA on T2-weighted MR imaging of the liver parenchyma.

**Materials and Methods:** Forty-six patients who were known or suspected of having malignant hepatic tumors (Group 1) underwent MR imaging of the liver including breath-hold T2-weighted fast spin-echo imaging before and after 4 minutes Gd-EOB-DTPA enhancement. Visual assessment and signal intensity (SI) measurements were performed to evaluate the effects of Gd-EOB-DTPA on the T2-weighted images of the liver. Additionally, 13 healthy volunteers (Group 2) who underwent MR imaging before and after 35 minutes Gd-EOB-DTPA enhancement were also evaluated.

**Results.** In the qualitative analysis, the visual SI of hepatic vessels on enhanced T2-weighted MR images in group 1 was significantly higher than that on unenhanced T2-weighted MR images ( $p < 0.001$ ) (Fig. 1). In group 2, there was no significant difference in the visual SI of hepatic vessels between unenhanced and enhanced T2-weighted MR images. In the enhancement effect of liver parenchyma, there was no significant difference in the visual SI between unenhanced and enhanced T2-weighted MR images in group 1 (Fig. 1). Conversely, in group 2, the visual SI of liver parenchyma on enhanced T2-weighted MR images was significantly lower than that on unenhanced T2-weighted MR images ( $p = 0.008$ ). In the quantitative analysis, the mean SI ratio (SIR) of liver parenchyma on enhanced T2-weighted MR images was significantly higher than that on unenhanced images ( $p < 0.001$ ) in group 1. Conversely, the mean SIR ( $p < 0.001$ ) as well as visual SI ( $p = 0.008$ ) in group 2 was significantly lower on enhanced images than on unenhanced T2-weighted MR images, indicating the effect of T2 shortening due to highly concentrated Gd-EOB-DTPA in the liver parenchyma.

**Conclusions.** Gd-EOB-DTPA had visually little impact on T2-weighted MR images obtained within 4 minutes after administration although hepatic vessels were slightly enhanced. Conversely, the substantial decrease of SI of liver parenchyma can be observed on T2-weighted images in hepatobiliary phases. Therefore, we recommend that enhanced T2-weighted MR images should be obtained at the early period after Gd-EOB-DTPA administration between contrast-enhanced dynamic series and hepatobiliary phase imaging.

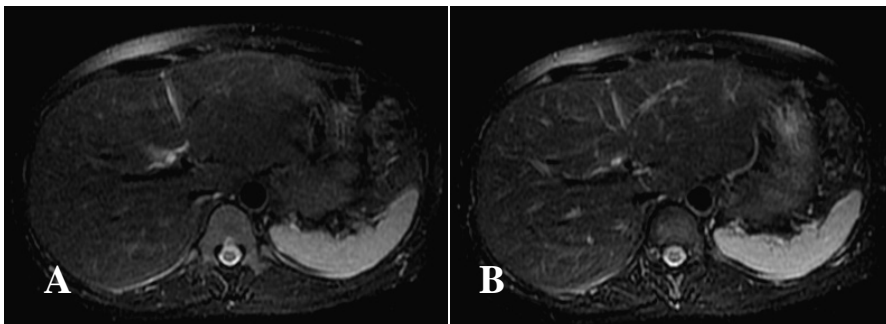


Fig. 1: 50-year-old woman. A and B, Breath-hold T2-weighted FSE images acquired before (A) and 4 minutes after (B) Gd-EOB-DTPA administration. B was rated as having same signal intensity of the liver parenchyma in comparison with A. B was rated as having higher signal intensity of the hepatic vessel in comparison with A.