Comparison of hepatic enhancement and tumor-to-liver contrast at Gd-EOB-DTPA enhanced MR imaging between 1.5 T and 3.0 T

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Objective:

The purpose of this study was to compare hepatic enhancement and tumor-to-liver contrast at Gd-EOB-DTPA enhanced MR imaging between 1.5 T and 3.0 T.

Materials and methods:

This study included 89 patients who underwent Gd-EOB-DTPA enhanced MRI for the evaluation of liver tumors. Of the patients, 31 had HCC and 10 had metastatic liver tumors. MR imaging was performed with 1.5 T or 3.0 T units (Signa Excite HD, GE Healthcare). Axial fat suppressed T1-weighted 3D gradient echo (LAVA) MR images were obtained before and 10, 20, and 40 min after the injection of Gd-EOB-DTPA at 1.5T in 53 patients and at 3.0 T in the other 36 patients. In 28 patients, the 40-min delay images were obtained at both 1.5 T and 3.0 T. The fat-suppressed LAVA images were obtained using almost identical parameters for 1.5 T and 3.0 T, respectively, as follows: TR=4.5 and 4.7 msec; TE=2.2 and 2.3 msec; inversion time=7 and 5 msec; flip angle=12 degrees; FOV=34 cm; slice thickness=4 mm; Matrix=320x192; reduction factor for parallel imaging (ASSET)=2. As a qualitative analysis, signal intensity (SI) of liver parenchyma, muscle, and liver tumors were measured, and liver-to-muscle SI ratio and tumor-to-liver SI ratio were calculated. As a quantitative analysis, conspicuity of liver tumors was evaluated using 4-pont scale.

Results

The mean liver-to-muscle SI ratio and tumor-to-liver SI ratio increased with time at both 1.5 T and 3.0 T. On the images obtained 40 min after injection in the 28 patients who underwent both 1.5 T and 3.0 T, the mean liver-to-muscle SI ratio at 1.5 T and 3.0 T were 2.47 and 2.43, and the mean tumor-to-liver SI ratio were 1.60 and 1.79, respectively. There were no statistically significant differences between 1.5 T and 3.0 T in liver-to-muscle SI ratio, tumor-to-liver SI ratio, and conspicuity of liver tumors.

Conclusion

Hepatic enhancement and tumor-to-liver contrast on Gd-EOB-DTPA enhanced MR images at 3.0 T were similar to those at 1.5 T.