

Contrast-enhanced MR cholangiography with Gd-EOB-DTPA: visualization of the biliary ducts in comparison with HASTE MR cholangiography

Y. Fukukura¹, T. Kamiyama¹, K. Takumi¹, T. Shindo¹, Y. Kumagai¹, and M. Nakajo¹

¹Radiology, Kagoshima University Graduate School of Medical and Dental Sciences, Kagoshima, Kagoshima, Japan

The purpose of this study was to assess the quality of biliary duct visualization using Gd-EOB-DTPA-enhanced magnetic resonance cholangiography (EOB-MRC) compared with half-Fourier acquisition single-shot turbo spin-echo magnetic resonance cholangiography (HASTE-MRC).

Methods and Materials

During 6-month period, EOB-MRC using breath-hold 3D T1-weighted fast low-angle shot technique was performed 20 minutes after Gd-EOB-DTPA administration using a 3-T MR system in 50 patients who were referred for evaluation of known or suspected hepatic tumors. Among the 50 patients, 46 patients (29 men, 17 women; mean age, 61 years; age range, 23-83 years) who had no previous hepatic or biliary surgery were enrolled in this study. Of these 46 patients, 25 patients had normal liver parenchyma and 21 had liver cirrhosis. Before Gd-EOB-DTPA administration, HASTE-MRC was obtained using a sequential multislice acquisition technique with a 20-second single breath holding. Three readers independently assessed the anatomical visualization of the biliary tree on a 5-point scale.

Results

In all patients, EOB-MRC showed significantly improved visualization of cystic duct (average score of three readers 3.43 vs. 3.01; $P<0.05$), and first (average score of three readers 4.12 vs. 3.75; $P<0.005$) and second division ducts (average score of three readers 3.00 vs. 2.51; $P<0.0005$) in comparison with HASTE-MRC. The grade of visualization of the common bile duct (average score of three readers 3.43 vs. 4.05; $P<0.0005$) and gallbladder (average score of three readers 1.46 vs. 4.45; $P<0.0001$) on EOB-MRC were significantly lower than HASTE-MRC. The visualization of the first (average score of three readers 3.81 vs. 4.37; $P<0.005$) and second division ducts (average score of three readers 2.64 vs. 3.29; $P<0.05$) were graded with a lower score in patients with liver cirrhosis in comparison with patients with normal liver function. In patients with liver cirrhosis, there was no significant difference between EOB-MRC and HASTE-MRC in the grade of visualization of cystic duct, and first and second division ducts.

Conclusion

EOB-MRC may be more useful in the evaluation of cystic duct, right and left hepatic duct, and second division ducts compared with HASTE-MRC in patients with normal liver function.