Prospect of hypovascular hepatocellular nodules showing hyper-intensity only in the hepatobiliary phase of Gd-EOB-DPTA enhanced magnetic resonance imaging in cirrhosis or chronic hepatitis

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Target audience: Radiologist, physician.

Purpose: The aim of this study was to evaluate the outcomes of small hypovascular nodules detected on only hepatobiliary phase of Gd-EOB-DTPA enhanced MR imaging as hyper-intensity.

Methods: Among 139 patients with chronic hepatic disease who had undergone Gd-EOB-DPTA enhanced MR imaging twice or more between January 2008 and January 2012, this study included 15 patients with hepatocellular nodules that showed hyper-intensity in the hepatobiliary phase, no signal changes in other sequences including T1, T2-weighted MR images, and were not detected in dynamic vascular phase images. The subjects included 11 males and 4 females, with an average age of 65.2 years. The underlying cause of chronic hepatic disease was hepatitis B in 4 patients, hepatitis C in 6, both hepatitis B and C in one, alcoholism in 3 and hepatitis of unknown etiology in one patient. All patients had liver cirrhosis (Child A=14, Child B=1, Child C=0). The progression of all nodules was followed to examine changes in size and hypervascularization.

Results: A total of 127 hypovascular nodules showing hyper-intensity in the hepatobiliary phase were identified in 15 patients. The median observation period of nodules was 642.7±390.4 days (range, 199 to 1366 days), and their mean initial size was 10.3±2.1 mm (range, 5.9 to 17.1 mm). Eighty-three of the 127 nodules showed a pattern of homogeneous hyper-intensity in the hepatobiliary phase whereas 44 nodules showed a pattern of peripheral dominant hyper-intensity in the hepatobiliary phase. 123 of 127 nodules did not show the increase in size more than 2 mm (mean growth rate; 0.13 mm/year, range; -0.07 - 0.93 mm/year) during the follow-up period while 4 nodules increased in size more than 2 mm (mean growth rate; 3.19 mm/year, range; 1.65 - 6.19 mm/year). All of these 4 nodules showed a pattern of peripheral dominant hyper-intensity. There were no nodules which showed hypervascularization during the course of observation.

Discussion: In this study, none of the nodules showed hypervascularization during follow-up periods, and most of these nodules did not show the increase in size. Therefore, our results suggested that small hypovascular hepatocellular nodules showing hyper-intensity only in the hepatobiliary phase without increase in size might be clinically benign lesions. However, we should also notice that a small part of hyper-intense nodules (n=4, peripheral dominant hyper-intensity type) showed the interval growth, possibly suggesting a malignant potential. Some nodules presenting hyper-intensity in the hepatobiliary phase have been reported to be focal nodular hyperplasia (1), hepapocellular adenoma (2) and HCC (3-5). However, these nodules had been already hypervascular on the initial MR examination and are, therefore, distinguishable from the nodules followed in this study, which were detected only in the hepatobiliary phase as hyper-intensity. Regarding the nature of nodules, histological consensus of these hypovascular hepatocellular nodules showing hyper-intensity detected only in the hepatobiliary phase remains undetermined at present.

Conclusion: Small hypovascular hepatocellular nodules showing hyper-intensity only seen in the hepatobiliary phase of Gd-EOB-DPTA enhanced MR imaging without increase in size in patients with chronic liver disease may be observable lesions with clinical benignity.

References:

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Gd-EOB-DTPA-enhanced MR imaging