

Prospective Comparison of Gadoxetate MRI and Contrast Enhanced CT for the Diagnosis of Equivocal Lesions Seen on CT - Preliminary Results

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INTRODUCTION: Gadoxetate disodium is a gadolinium based contrast agent that exhibits 50% biliary excretion, allowing for imaging of a delayed hepatocyte phase in addition to typical MR sequences. In the setting of cirrhosis screening for hepatocellular cancer (HCC), CT often demonstrates equivocal lesions, usually small regions of arterial enhancement without washout on portal venous phase images. We prospectively studied the utility of gadoxetate for the further evaluation of equivocal lesions on CT in patients with cirrhosis.

MATERIALS AND METHODS: The local committee for human research approved this study. Between August 2010 and September 2011, we prospectively enrolled 25 patients (average age 59.0 years, SD = 8.0). The most common cause of cirrhosis was HCV (n=19). Inclusion criteria included patients who underwent liver protocol CT at our institution with cirrhosis who had indeterminate lesions. These patients were then scheduled for a liver MRI using gadoxetate within two weeks of the CT examination. All patients received 0.025 mmol per kg of gadoxetate disodium (Eovist, Bayer Healthcare). All examinations were performed on a 1.5T magnet (Siemens Avanto, Erlangen Germany). Prior to the administration of contrast the following sequences were obtained: dual echo T1, T2, and precontrast T1 with fat saturation. Care Bolus was used to determine the timing for the arterial phase. After the administration of contrast arterial, portal venous phase and delayed images at 5, 10 and 20 minutes were acquired. Lesions were graded from 1 to 5 (1 = benign, 2 = likely benign, 3 = indeterminate, 4 = likely malignant, 5 = malignant)

RESULTS: 32 lesions in 25 patients were imaged. After the administration of Eovist, 13 lesions were downgraded, 11 lesions were upgraded and 8 lesions retained the same grade. The most common grade score on CT was 2 (n=19) followed by 3 (n=6), while on MRI the most common grade was 1 (n=16) followed by 4 (n=8).

DISCUSSION: In this interim report, gadoxetate appears to aid in the evaluation of indeterminate lesions seen on CT in cirrhotic patients. This has potential clinical implications as patients can be referred for urgent treatment or be listed for liver transplantation sooner. Additional follow-up will need to be performed, and additional patients will be enrolled with goal enrollment of 50.

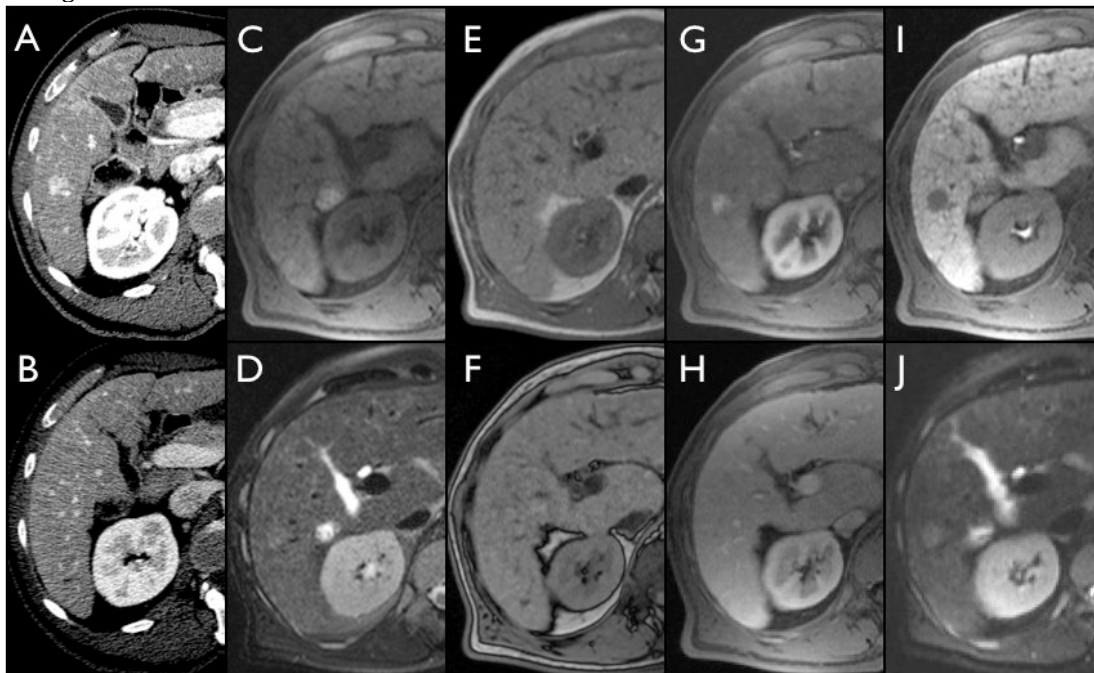


Figure 1: Example CT (A arterial, B portal venous phase) and MR (C precontrast, D T2, E in phase, F out of phase, G arterial, H portal venous phase, I hepatocyte phase, J diffusion) demonstrating a segment 6 arterial enhancing lesion which does not washout on portal venous phases, but does washout on hepatocyte phases consistent with a hepatocellular carcinoma (Grade 4), although on CT it appears to represent nodular arterial phase hyperenhancement (Grade 2).