

Accuracy of MRI for the detection of hepatocellular carcinoma in patients with cirrhosis: Correlation with the whole explanted liver

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Purpose: Imaging has become the basis for the diagnosis of hepatocellular carcinoma (HCC) after the United Network for Organ Sharing relaxed the biopsy requirement for arterially enhancing lesions with typical imaging characteristics of HCC. Our aim is to evaluate the accuracy of MR imaging for the detection of HCC using explant correlation.

Materials and Methods: Eighty patients without history of treated HCC who underwent MR imaging and liver transplantation within 90 days were included in this study. MR imaging was performed on 1.5T field strengths using T1-weighted gradient-echo (GRE), T2-weighted fast spin-echo, and multiphase dynamic gadolinium-enhanced 3-D spoiled GRE sequences. An independent retrospective review of the MR images was performed by two radiologists who were blinded to the initial MR interpretations and the pathologic findings in the explanted liver. Interobserver agreement was determined using Kappa statistic. The sensitivity, specificity, positive and negative predictive values, and the positive and negative likelihood ratios of MR imaging for the detection of HCC, on a patient-by-patient basis, were calculated.

Results: Twenty eight (35%) of 80 patients had HCC in the explanted liver. There was excellent interobserver agreement ($k=0.9$); Reader 1 detected HCC in 27 patients and had 7 false positive and 1 false negative HCC diagnoses, and reader 2 detected HCC in 26 patients and had 7 false positive and 2 false negative HCC diagnoses. The mean number of tumors per patient on pathology was 1.6 compared to 1.9 on MR imaging ($p=0.5$), and the mean maximum diameter was 2.5 cm compared to 2.9 cm on MR imaging ($p=0.2$). For the detection of HCC, MRI had an overall sensitivity, specificity, positive predictive value, negative predictive value, positive likelihood ratio, and negative likelihood ratio of 96%, 85%, 77%, 97%, 24, and 0.04, respectively.

Conclusion: MR imaging is a reliable technique for the detection of HCC prior to liver transplantation.