**Purpose:**
To evaluate the role of diffusion weighted imaging as a potential screening tool for HCC in patients with cirrhosis.

**Background:**
Ultrasound, computerized tomography scanning, and magnetic resonance imaging are commonly used to screen for hepatocellular carcinoma (HCC) in patients with cirrhosis. Early diagnosis is crucial as prognosis is poor in advanced HCC, while patients diagnosed with early stage disease may receive potentially curative therapies. Optimal strategy for HCC surveillance needs to be better characterized.

**Materials & Methods:**
This single institution retrospective study was performed after obtaining IRB approval. MRI scans of 37 patients who had undergone liver transplant were evaluated and findings correlated with liver explant data. Data was collected from August 2009 to April 2013. 25 male subjects and 12 female subjects age range 21-70 years were enrolled. All patients had MRI scans within six months of explant. MRI images from 17 subjects with liver lesions at imaging subsequently proven to be HCC at explant, and 20 controls without liver lesions by imaging and pathology were randomized. The studies were reviewed by three independent readers blinded to the MRI and pathology reports in two separate sittings. First, only the diffusion weighted images were interpreted. In the second sitting, the entire multiphasic MRI exam was reviewed. A consensus read was obtained by two separate radiologists who had access to the patients’ explant data.

**Results:**
Averaged results of the three independent readers demonstrated a sensitivity of 78% and specificity of 88% for DWI alone for detection of liver lesions, with a positive predictive value of 85% and a negative predictive value of 83%. The results of the review of the entire MRI exam showed a sensitivity of 86% and a specificity of 87% with a positive predictive value of 86% and a negative predictive value of 89%. McNemar Change test revealed no significant difference between the DWI and multiphasic study. Lesions identified on DWI ranged in size from 1.5 to 5 cm. Detection of lesions was decreased in the presence of artifact from motion, large ascites, and technical issues.

**Conclusion:**
Diffusion weighted MRI has NPV and PPV comparable to contrast enhanced multiphasic MRI examination for hepatocellular carcinoma detection. DWI may have a role in screening patients with cirrhotic livers.

**Teaching points:**
1. DWI MR has potential use for screening for HCC in cirrhosis.
2. Best application of DWI screening is likely in echogenic or steatotic livers.

**References:**