

# 'HEAD TO TOE'

A MESSAGE FROM THE DESK OF RADIOLOGY ASSOCIATES

## New MRI contrast agent for hepatobiliary applications

Recent advances in magnetic resonance imaging include new intravenous contrast agents to specifically target the liver. Gadoxetic acid (Eovist, Bayer Pharmaceuticals), currently the most widely used hepatocyte specific contrast agent, was approved by the FDA in 2008 for the detection and characterization of liver tumors.

Hepatocytes actively take up gadoxetic acid using the same membrane transporter (OATP) that extracts bile acids and bilirubin from the bloodstream. Gadoxetic acid is then excreted into the biliary ducts, after which it passes along with bile into the gallbladder and duodenum.

Use of a hepatocyte specific contrast agent can prove valuable in a number of ways:

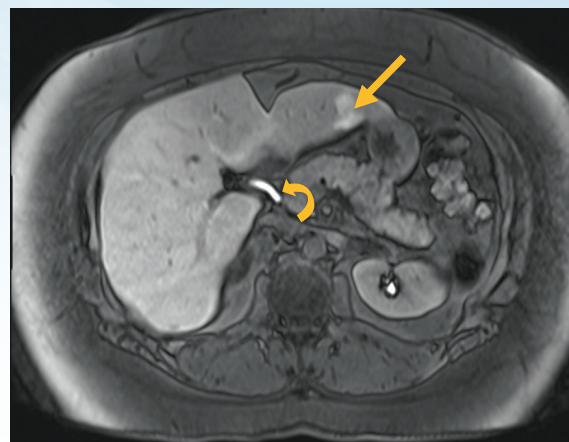
- Gadoxetic acid is useful to evaluate for liver metastases. A study has shown increased ability of gadoxetic acid to detect small (<1cm) metastases in comparison with extracellular contrast agents [2].
- As is well known, patients with cirrhosis have an increased risk of developing hepatocellular carcinoma. Several studies [3,4] have shown that the appearance of suspicious hepatic nodules during the hepatobiliary enhancement phase (with gadoxetic acid) is highly sensitive for the detection of HCC—including lesions without classic arterial enhancement.
- The second most common benign liver tumor is focal nodular hyperplasia (FNH), easily diagnosed with the use of gadoxetic acid. FNH takes up the contrast agent, but

then has no viable excretion pathway to pass the contrast into the bile ducts. Thus, the retained contrast within FNH becomes more and more conspicuous with time (see Figure).

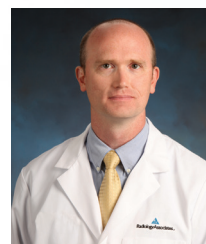
- Gadoxetic acid can provide functional biliary information, such as whether a stricture is obstructing bile flow. In the setting of a suspected bile leak, gadoxetic acid can pinpoint the source of a leak and prove that a fluid collection contains excreted bile.

In summary, new hepatocyte specific contrast agents have been proven highly useful in the detection and characterization of liver lesions.

1. Agarwal S et al. Update on Liver MRI Contrast Agents. *Body MRI Categorical Course Syllabus*. American Roentgen Ray Society 2013.
2. Zech CJ, et al. MR imaging in patients with suspected liver metastases: value of liver specific contrast agent Gd-EOB-DTPA. *Magnetic Resonance in Medical Sciences* 2007; 6:43-52
3. Ahn SS et al. Added value of gadoxetic acid-enhanced hepatobiliary phase MR imaging in the diagnosis of hepatocellular carcinoma. *Radiology* 2010; 255:459-466
4. Sano K, et al. Imaging study of early hepatocellular carcinoma: usefulness of gadoxetic acid-enhanced MR imaging. *Radiology* 2011; 261:834-844



Axial VIBE delayed post contrast image after gadoxetic acid injection. Focal nodular hyperplasia is present in the left hepatic lobe (arrow). Also note contrast excreted within the common bile duct (curved arrow).



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