Hepatic Adenoma: Double contrast magnetic resonance imaging features.

Clinical History:
A 42 year old male with a liver lesion underwent double contrast magnetic resonance imaging (DCMRI) to further characterise the lesion.

Imaging Findings:
Clinical History: A 42 year old male was found to have a liver lesion on routine ultrasound on a background of a pancreatic insulinoma. The lesion was thought to be a metastatic deposit. He was referred for radiofrequency ablation (RFA). DCMRI was performed to characterise the lesion. It was confidently classified as benign adenoma on DCMRI. A percutaneous lesion biopsy showed normal liver and RFA was refused. There was concern that the lesion might have been missed on biopsy and the patient therefore wanted the lesion resected. The diagnosis was confirmed as a hepatocellular adenoma at surgery. (Figure 1) Imaging findings: On unenhanced MRI, there is low signal intensity seen on out-of-phase T1 weighted imaging, while the adenoma is isointense with the liver on T2-weighted imaging. With fat saturated T1-weighted imaging, there is low signal intensity and a hyperintense rim (figure 2). Using DCMRI, hepatic adenomata take up superparamagnetic iron oxide (SPIO) while with gadolinium there is early diffuse enhancement followed by rim enhancement (figure 3).

Discussion:
Hepatocellular adenoma affects males and females with equal frequency. It usual arises between the ages of 16 and 60 years. It may be associated with glycogen storage disease, oral contraceptive pill or anabolic steroid use. Fifty per cent of patients have multiple adenomata. Patients are usually asymptomatic and usually no treatment is indicated. The main indication for treatment is the presence of significant clinical symptoms, suspicion of malignancy or fear of malignant transformation [1]. Recognised complications include haemorrhage and rupture [2]. Imaging findings include haemorrhage, fatty change, the appearance of a pseudocapsule or inhomogenous enhancement. SPIO uptake is characteristic. Only adenoma and hepatocellular carcinoma contain fat and appear encapsulated. With these features in a non-cirrhotic liver, (especially if SPIO uptake is shown) the diagnosis of adenoma may be suggested. Confidently characterising previously indeterminate lesions as benign reduces the need for biopsy and follow up imaging. DCMRI synergistically combines unenhanced multi-sequence MRI with SPIO, gadolinium chelate enhancement and multiplanar, 3D imaging. Uniquely, in a single examination, it allows the radiologist to detect very small focal liver lesions and to assess their water and fat content, Kupffer cell function and vascularity in the arterial, portal venous and late (equilibrium) phases. SPIO is the most effective method for detecting small metastases and characterising benign hepatocellular lesions e.g. regenerative nodules, dysplastic nodules, focal nodular hyperplasia (FNH) or hepatocellular adenomas. This is because the presence or absence of Kupffer cell function is an important determinant of benign or malignant pathology in many cases [3]. Gadolinium increases the detection and characterization of hypervascular lesions, on the basis of perfusion pattern. This is particularly useful for the
diagnoses of hepatocellular carcinoma, haemangioma and FNH. When SPIO and gadolinium are administered sequentially, their magnetic properties combine. This increases lesion conspicuity because the SPIO produces an increase in contrast between the reduced signal intensity of the background liver and the increased signal intensity of the gadolinium enhanced lesion.

**Differential Diagnosis List:** Hepatocellular adenoma.

**Final Diagnosis:** Hepatocellular adenoma.

**References:**


Description: Gross specimen from partial hepatectomy showing hepatocellular adenoma. Origin:
Description: Unenhanced MRI showing hepatocellular adenoma. Origin:
Figure 3

Description: DCMRI of hepatic adenoma. Origin: