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EDUCATION AND IMAGING

Hepatobiliary and Pancreatic: Malignant wash-out pattern of hepatocellular cancer using dynamic MR imaging

The clinician now has a variety of different imaging options for the diagnosis of hepatocellular cancer. These include ultrasonography (US) with or without intravenous contrast, computed tomography (CT) with or without contrast, magnetic resonance (MR) with or without contrast and hepatic angiography. The usual screening test is high-resolution US that can permit the detection of hepatic lesions < 1 cm in diameter. If a focal lesion is detected or suspected, the next step is usually a contrast-enhanced CT or MR scan. Although the relative merits of these options are debated, some authors prefer MR scans using either gadolinium chelates or superparamagnetic iron oxide as the contrast agent. With the development of faster MR techniques, the entire liver can now be imaged in multiple phases of contrast enhancement including arterial, portal and delayed phases. Most reports have focussed on gadolinium-enhanced scans using T1-weighted images. The typical appearance of hepatocellular cancer is homogeneous or peripheral (rim) enhancement of the neoplasm. This can also be associated with an early 'wash-out sign' as illustrated below. These appearances reflect the fact that hepatocellular cancers are hypervascular, often with arteriovenous shunting, and derive most of their blood supply from the hepatic artery.

The patient illustrated below was a 74-year-old man who was investigated because of epigastric discomfort and abdominal distension after meals. A US study showed a solid mass lesion in the left lobe of the liver. With a MR scan, there was a non-homogeneous mass lesion in the left lobe that measured $16 \times 12 \times 10$ cm in size. The MR features were consistent with hepatocellular cancer in that the lesion was hypointense using T1-weighted images and hyperintense using T2-weighted images. There were also satellite lesions in the right lobe of the liver that showed similar intensity characteristics. After the administration of gadolinium, the lesions showed marked enhancement in the arterial phase when compared to the normal liver (Figure 1). In the late venous phase, the normal liver was enhanced but the lesions showed a 'wash-out' pattern that is typical for hypervascular lesions that are either primary or metastatic neoplasms (Figure 2). In this patient, a tru-cut biopsy confirmed the presence of hepatocellular carcinoma.

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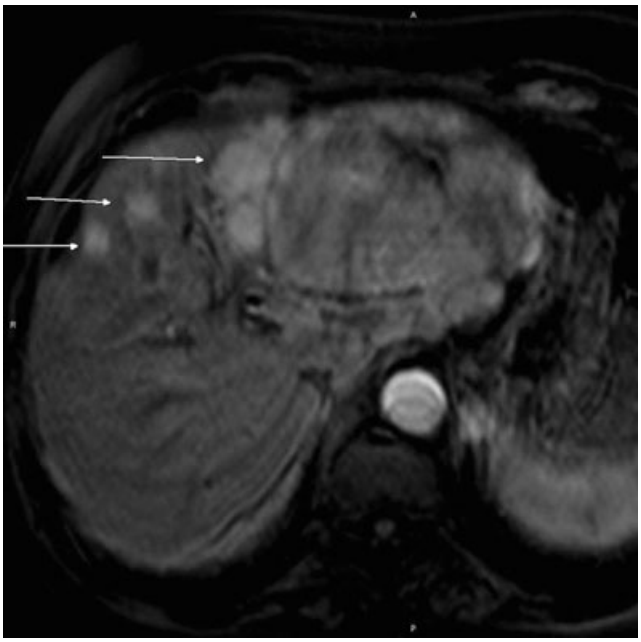


Figure 1

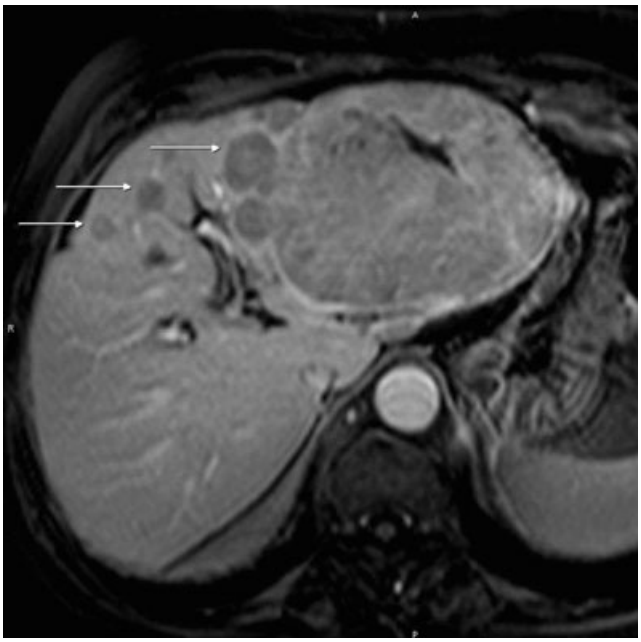


Figure 2