Case 1988

Multifocal exophytic hepatocellular carcinoma: multislice spiral CT findings with multiplanar reconstructions
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Patient: 87 years, female

Clinical History:
A patient with a history of chronic hepatitis C, presented with a macronodular enlarged liver containing one heterogeneous hepatic mass and another mass, of unclear origin (hepatic exophytic mass, renal mass or adrenal mass).

Imaging Findings:
A patient with a history of chronic hepatitis C, presented with elevated alpha-fetoprotein levels. She underwent sonographic examination, which revealed a macronodular enlarged liver containing one heterogeneous hepatic mass (not shown) and another mass, of unclear origin (hepatic exophytic mass, renal mass or adrenal mass), which was localised within Morrison's pouch. Contrast-enhanced spiral CT examination was subsequently performed for further characterisation of the lesions. This revealed at least three masses, two of which were located in the IV and VIII hepatic segments. A third lesion, whose exact origin, whether arising from liver or from kidney and subsequently invading the liver, was not clearly assessed on axial images, was also identified. Multiplanar reconstructions on sagittal and coronal projections clearly showed that the mass originated within the liver and extended caudally. All the lesions showed strongly heterogeneous, fast enhancement during the arterial phase, with subsequent rapid wash-out during the portal phase.

Discussion:
Hepatocellular carcinoma (HCC) is the most common primary hepatic epithelial malignancy. It usually occurs in association with chronic liver disease. There are two common gross patterns of HCC: an expansile pattern and a diffuse pattern. About 10% of HCCs are multifocal. The sonographic appearance is variable and often non-specific. Some features, however, may suggest the diagnosis: a peripheral hypoechoic rim, corresponding to the capsule; a target appearance with a hypoechoic halo; a mosaic pattern; and lateral shadowing. On non-contrast CT scans the lesion is usually seen as a hypodense lesion. However, rarely, calcification or diffuse increased densities related to iron overload may be observed. The most common CT appearance of HCC in the arterial phase is as a hyperattenuating or mixed attenuation lesion. However, hypoattenuating HCC lesions are observed in about 10% of cases.
Combining the advantages of a multirow detector array with a fast gantry rotation time, multidetector computed tomographic scanners can acquire sections at a faster rate than was previously possible. As a result, multidetector CT permits scanning during multiple specific phases of intravenous contrast enhancement and the acquisition of very thin sections over a large area, allowing the creation of multiplanar reconstructions with high z-axis resolution. With the rapid scanning ability of multidetector CT, it is feasible to obtain a three-dimensional data set of the entire liver during a single breath hold. With reconstruction of these data, high-quality three-dimensional images may be obtained. The image quality in reconstructed sagittal, coronal, or curved planes is excellent in most cases. The use of curved multiplanar reconstruction along a dilated biliary tree or along vessels may more clearly elucidate the anatomical and pathological characteristics than the reading of axial images alone. Such unique imaging approaches may ultimately improve lesion detection, characterisation, and surgical planning.

In conclusion, multidetector CT allows highly precise imaging during three (or more) distinct phases of hepatic enhancement. Optimal acquisition timing, in combination with thinner collimation, permits improved lesion detection and characterisation. As shown in this case, the multiplanar reconstructed images clearly depict the hepatic origin of the exophytic mass, which extended towards the kidney. Therefore, with the advances in rapid volume rendering and other three-dimensional techniques, a new era of CT-based three-dimensional imaging of the abdominal viscera is becoming a reality.

**Differential Diagnosis List:** Multifocal exophytic hepatocellular carcinoma

**Final Diagnosis:** Multifocal exophytic hepatocellular carcinoma

**References:**


**Figure 1**

Description: Contrast-enhanced abdominal spiral CT revealed a cirrhotic liver, characterised by smooth irregular margins, containing at least three enhancing nodules, located in the IV-VIII, and VI hepatic segments. The latter lesion was strictly contiguous with the ipsilateral kidney. **Origin:**
Description: Sagittal reconstructions revealed that the mass clearly originated from the liver, because of the clear cleavage margins with the kidney. Origin:
Description: Coronal reconstructions revealed that the mass clearly originated from the liver, because of the clear cleavage margins with the kidney. Origin: