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Visualization of Hepatic Adenoma with Tc-99m di-Isopropyl IDA

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A case of hepatic adenoma is reported, presenting as a defect on sulfur colloid liver image and visualized on a biliary scintigram. Although biliary imaging in the evaluation of sulfur colloid defects may be of value in selected patients, combination imaging in this case could not distinguish a benign from a malignant process.

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The Tc-99m IDA biliary imaging agents are processed by the parenchymal cells of the liver, whereas Tc-99m sulfur colloid is concentrated by the Kupffer cells. A case of hepatic adenoma is presented, visualized on a biliary image but appearing as a focal defect with sulfur colloid. Combination imaging suggested hepatocyte function but none in the retriculoendothelial system (RES). It could not distinguish benign from malignant disease.

Sulfur colloid scintigraphy continues to play an important role in the evaluation of the liver. However, its nonspecificity with respect to focal defects has contributed to the increased use of ultrasound and transmission computerized tomography (TCT). Combination imaging with gallium-67 citrate (*1,2*), Tc-99m-labeled red blood cells (*3*), Tc-99m-labeled hepatobiliary agents (*4*), and In-111-labeled leukocytes (*5*) has been advocated to improve specificity. Lamki recently discussed dichotomous hepatic uptake of Tc-99m IDA and Tc-99m sulfur colloid (TcSC) (*6*).

This report describes the use of Tc-99m diisopropyl IDA to assist TcSC imaging. The tumor presented as a large focal defect on liver-spleen scintigram; it was solid by ultrasound. Tc-99m IDA imaging revealed hypervascularity as well as radionuclide concentration within the lesion. Gamma imaging therefore suggested hepatocyte function but no RES function.

CASE REPORT

A 77-yr-old male presented with a history of right upper quadrant fullness. He admitted consumption of 250 cc of alcohol per day, and was taking only digoxin and a diuretic for arteriosclerotic heart disease.

On physical examination he was found to have hepatomegaly but no other abnormalities.

Laboratory tests indicated normal liver function. A TcSC image showed a large photopenic area in the right lobe (Fig. 1, left). Ultrasound disclosed a 9.5-cm mass with multiple internal echoes (Fig. 1, right). A Tc-99m DISIDA series showed increased vascularity in the area of the sulfur colloid defect, and complete filling in of the defect on the hepatic-phase images (Fig. 2). Percutaneous liver biopsy was typical of hepatic adenoma (Fig. 3) as described by Kerlin et al. (*8*).

DISCUSSION

A focal defect identified on liver image is often a nonspecific finding. Kupffer cells phagocytize sulfur colloid, and absence of radionuclide activity implies failure of these cells. Many modalities are available to improve specificity, including TCT, ultrasound, angiography, and various radiotracer approaches. Utz first reported visualization of a hepatoma with the biliary agent Tc-99m pyridoxylidene glutamate (*7*). Subsequently, many causes for discordant hepatic uptake of Tc-99m sulfur colloid and hepatobiliary agents have been identified (*6,9*).

Our case provides an example of discordant imaging in a benign liver tumor. Histologically, hepatic adenomas are characterized by hepatocyte proliferation devoid of bile ducts and Kupffer cells. Lamki lists hepatic adenoma as a common cause of a photopenic defect on the colloid image, but intense or normal uptake with IDA (*6*). In this case the value to the clinician is unclear. Firstly, dichotomous uptake of Tc-99m IDA and TcSC could not separate benign from malignant disease. Secondly, it is unlikely that the constellation of scintigraphic and ultrasound findings would obviate the need for biopsy. Thirdly, after reviewing the literature, we consider the incidence of discordant images to be too low to justify routine use of Tc-99m IDA to evaluate colloid defects.

In selected cases, however, the information can be quite valuable. A good example is the evaluation of a solitary defect in or near the inferior margin of the liver. Usually a Tc-99m IDA image can establish the presence or absence of the gallbladder in this location (*10*).

Our patient presented clinically in an atypical way for hepatic adenoma. According to Kerlin et al. (*8*), these patients are gen-

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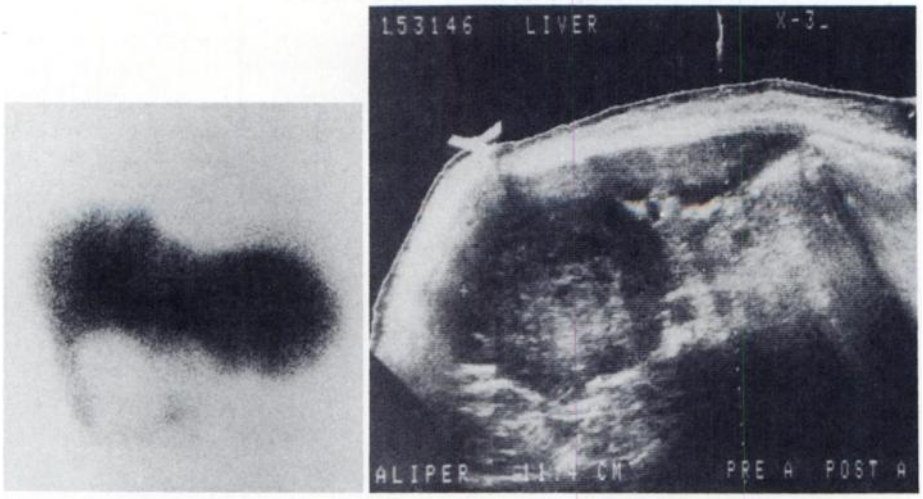

FIG. 1. Left: sulfur colloid liver image shows large photon-deficient area in right lobe. Right: ultrasonogram shows large mass with internal echoes.

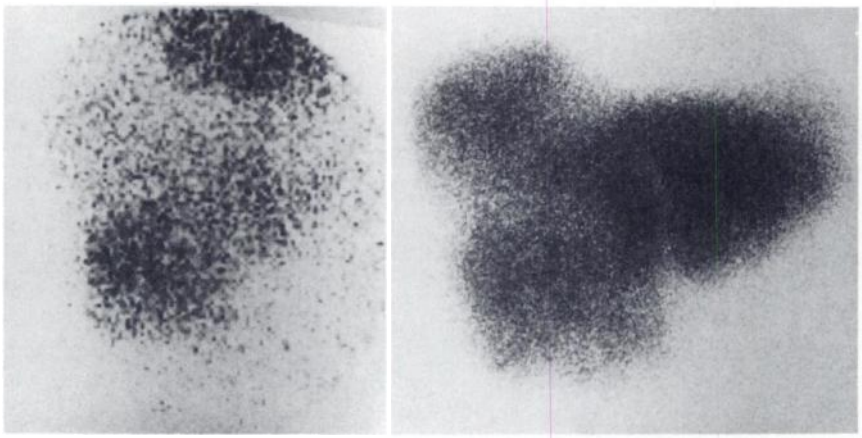

FIG. 2. Tc-99m DISIDA blood-pool image (left) demonstrating increased vascularity in region of defect. Hepatic-phase image (right) from DISIDA study shows filling in of colloid defect.

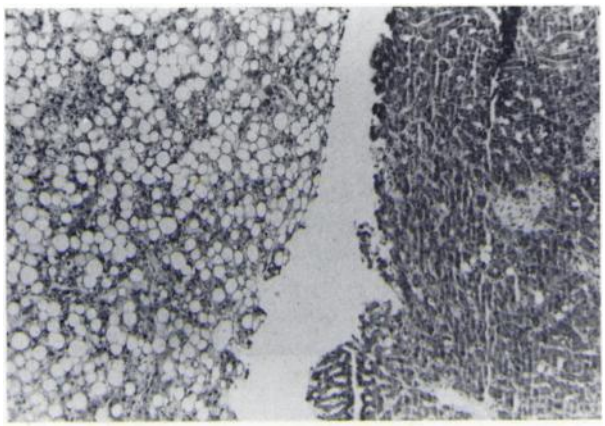

FIG. 3. Liver biopsy. 60× magnification: side-by-side view of adenoma and nonneoplastic liver. Note prominent intracellular vacuolization in adenoma.

erally young, and 91% are female. Most give a history of oral contraceptive use and approximately 50% present with abdominal pain. Pathologically, hepatic adenomas tend to be large (9 ± 1 cm), although small tissue samples, e.g., needle biopsy specimens, permit accurate diagnosis in the majority of cases (*8*).

In summary, we present an example of discordant hepatic imaging in an hepatic adenoma. The scintigrams could not distinguish hepatoma from benign disease.

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