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CT in Lobar Atrophy of the Liver Caused by Alveolar Echinococcosis

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Abstract: We reviewed the CT findings of 13 patients with histologically proved alveolar echinococcosis of the liver. Seven of these patients had hilar involvement, which caused dilatation of intrahepatic bile ducts and invasion of the portal vein or portal branches. In two of these patients we found marked atrophy of the right lobe and in one patient marked atrophy of the left lobe in addition to various CT findings previously reported for alveolar echinococcosis of the liver. The occurrence of lobar atrophy of the liver caused by alveolar echinococcosis has not been previously reported. We concluded that, when a mass lesion with hilar infiltration causing lobar atrophy is found in endemic areas, alveolar echinococcosis should be considered in the differential diagnosis in addition to malignant neoplasms. **Index Terms:** Echinococcosis—Liver, atrophy—Parasites—Computed tomography.

Hepatic alveolar echinococcosis (HAE) is a rare parasitic disease due to the intrahepatic development of the larva *Echinococcus multilocularis*. This disease is endemic in central Europe, the Soviet Union, northern Iran, northern Afghanistan, eastern Turkey, Japan and the Kurile islands, and central and northern North America (1,2). Its natural history and pathogenesis are well documented (1,3). The HAE lesion behaves like a malignant neoplasm growing by exogenous proliferation and resulting in invasive and destructive changes.

The role of CT in the diagnosis and management of HAE is well documented (1,3,4). Typical CT findings are a heterogeneous hypodense mass with irregular contours and indistinct margins which does not enhance after intravenous contrast medium injection. The lesion may contain calcifications and pseudocystic necrotic areas. They may cause biliary dilatation when the hilum of the liver is involved.

In addition to the above findings we have encountered hepatic lobar atrophy caused by hilar infiltration due to alveolar echinococcosis in three patients, who were part of a review of the CT findings of 13 patients with histologically proved HAE. Lobar atrophy of the liver caused by HAE has not been reported previously.

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MATERIALS AND METHODS

Our study group consisted of 13 patients with histologically proved HAE who had preoperative abdominal CT examinations between July 1986 and February 1991. Eight patients who were initially thought to have resectable lesions had laparotomies, and histologic examinations were performed on the resected tissue. The remaining five patients had CT-guided percutaneous core needle biopsies. The preoperative CT findings and pathological data were analyzed retrospectively in all cases. There were five women and eight men between 21 and 72 years of age. Computed tomography was performed with a high resolution scanner (Siemens Somatom DR H, Erlangen, Germany). After the administration of oral contrast medium, both pre- and postcontrast CT was performed usually with 8 mm section thickness at 8 mm intervals.

RESULTS

The liver was of normal size in three patients and hypertrophied in seven patients. Marked lobar atrophy of the liver was seen in the remaining three patients. Two patients had atrophy of the right lobe

(Figs. 1 and 2), and one patient had atrophy of the left lobe (Fig. 3). Compensatory hypertrophy of the remaining portion of the liver was not observed in these patients. The location of the parasitic lesion varied. In 5 of 13 cases only the right lobe was involved; in 3 of 13 cases only the left lobe was involved; and in 5 of 13 cases both lobes were involved. The lesion had infiltrated the liver hilus in 7 of 13 cases. Dilatation of intrahepatic bile ducts and invasion of the portal vein and/or portal branches were seen in all patients with hilar infiltration. All patients with lobar atrophy had hilar infiltration. Ten of 13 patients had only one lesion. Three patients had more than one lesion separated by parenchyma that appeared normal. The patient who had atrophy of the left lobe had a metastatic focus in the right lobe (Fig. 3). The gallbladder was in a retrohepatic location in one of the patients with atrophy of the right lobe (Fig. 1).

FIG. 2. Mass lesion, which simultaneously invades the liver, the liver hilum, and the right kidney. Right lobe of the liver is atrophic. The mass contains calcifications and pseudocystic areas.

DISCUSSION

When CT demonstrates a lobe of the liver to be absent or small the differential diagnosis includes surgical resection, agenesis, and atrophy. Surgical resection can be excluded by history and physical examination.

Agenesis of a hepatic lobe is a rare congenital anomaly, which is usually asymptomatic although stasis of bile predisposing to calculus formation has been reported due to the anomalous position and orientation of the gallbladder (5). The presence of a mass lesion with hilar invasion makes agenesis less likely.

Lobar or segmental atrophy of the liver has been described in a variety of conditions. The pathophysiology of atrophy is incompletely understood. The basic mechanism is considered to be decreased hepatic blood flow, which leads to a negative protein accretion in the parenchymal cells. This may result from obstruction of the portal vein or a hepatic vein leading to redirection of the blood flow or obstruction of the bile ducts, which is thought to result in diversion of portal blood flow away from the obstructed liver (6).

It is well known that cirrhosis can cause atrophy of hepatic lobes (7). Chronic schistosomiasis japonica and chronic focal biliary obstructions have been reported to cause atrophic changes (8). However, these conditions do not cause a well-defined mass

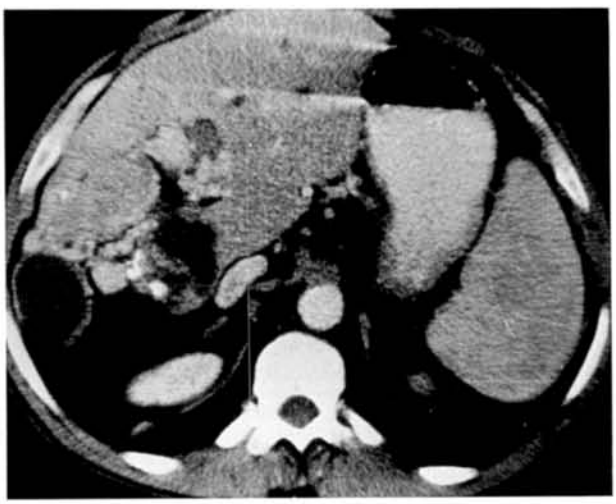

FIG. 1. Mass lesion of the liver with hilar invasion. The right lobe is atrophic. There are scattered areas of calcifications and a pseudocystic zone. The gallbladder is in a retrohepatic location. The hepatic flexure is posterior to the liver. Cavernous transformation of the portal vein is visualized.

FIG. 3. Infiltrative mass lesion with hilar invasion causes marked atrophy of the left lobe. Intrahepatic bile ducts are dilated. An additional focus is seen in the posterior segment of the right lobe.

lesion with hilar invasion in addition to lobar atrophy.

There are several reports in the literature describing lobar atrophy of the liver caused by cholangiocarcinoma (6,8,9). It was initially thought that lobar atrophy of the liver was a characteristic finding for cholangiocarcinoma. However, a recent report describes cases of lobar atrophy of the liver caused by hepatocellular carcinoma and metastasis in addition to cholangiocarcinoma (10).

The alveolar echinococcal lesion grows by external encasement accompanied by a marked fibroinflammatory reaction. The HAE lesion tends to infiltrate large areas of the liver, particularly the area of the porta hepatis. The infiltration, which behaves like a malignant neoplasm, causes stenosis of bile ducts, the hepatic veins, and portal branches and results in hypoperfusion of the liver, which leads to atrophy. Atrophy of a hepatic lobe usually results in compensatory hypertrophy of the remaining portion of the liver (10).

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