Angiomyolipoma is a benign neoplasm that has been reported frequently in the kidney but rarely in the liver. The radiologic appearances vary because of different compositions of fat, blood vessels, and muscle. We present a typical CT and angiographic appearance of hepatic angiomyolipoma in a 63-year-old female patient. The knowledge of imaging findings of hepatic angiomyolipoma will help making correct diagnosis and rendering proper treatment.

Key words: Angiomyolipoma; Hepatic tumor

CASE REPORT

During a routine physical checkup, a 63-year-old female patient was found on abdominal ultrasonography to have a well-demarcated hyperechoic liver mass, measuring 8 cm in maximum diameter, located in the lateral segment. Physical examination was unremarkable. Her liver function tests were normal and serologic assay for viral hepatitis was negative. The serum alpha-fetoprotein level was less than 3 ng/mL (normal < 6 ng/mL). Non-enhanced CT demonstrated a heterogeneously hypodense soft tissue mass with central low density, similar to adjacent fat in attenuation (Fig. 1). Following intravenous contrast administration, the mass showed patchy strong peripheral enhancement, but no obvious enhancement in the central hypodense area (Fig. 2). Celiac angiograms revealed that the lesion was inhomogeneously hypervascular, supplied by numerous engorged arteries from the left hepatic and left gastric arteries (Fig. 3a).

Because of uncertain nature of the lesion and the possibility of malignancy, left lateral hepatectomy was performed. The hepatic resection contained a solid brownish yellow tumor measuring 9x8x6 cm in size. Microscopically, the mass revealed features typical of angiomyolipoma, including blood vessels, smooth muscle, and mature fat (Fig. 4). Lymphocytic infiltration were found in the stroma, but no foci of extramedullary hematopoiesis were identified. The tumor arose form the liver mesenchyma, but the margin was not clearly demonstrated and there was no capsule. Immunostaining revealed desmin (+), smooth muscle actin (+), S100 protein (+), HMB-45 (+), epithelial membrane antigen (−), alpha-fetoprotein (−). These immunohistologic examinations confirmed the diagnosis of angiomyolipoma.
DISCUSSION

Angiomyolipoma occurs frequently in the kidney but rarely in the liver. Although renal angiomyolipoma is associated with tuberous sclerosis in 40% to 50% of patients [2], only 5.8% of patients with hepatic angiomyolipoma have tuberous sclerosis [3]. The first hepatic angiomyolipoma was described by Ishak in 1976 [4]. According to the review by Guidi et al, 49 cases of hepatic angiomyolipoma had been reported up to 1997 [5]. It is a benign mesenchymal tumor, with various composition of a mixture of smooth muscle, thick-walled blood vessels, and mature fat. Most patients have no symptoms or signs. The lesion is usually found on ultrasonography incidentally.

The fat components in the tumor are highly suggestive of angiomyolipoma, but the proportion of fat varies form less than 10% to more than 90% of the tumor volume, resulting in variable imaging appearances. On CT, it is difficult to differentiate from hepatoma with fatty metamorphosis, especially when the angiomyolipoma has a relatively low fat component. However, marked early and prolonged enhancement and the absence of a capsule is helpful in distinguishing angiomyolipoma from fat-containing hepatoma [6].

The angiographic appearance of an angiomyolipoma is described as onion-peel or whorled with abundant fine neovascularization and occasional nodular or vessel-like structures that are present until the venous phase [7]. In our case, there was a similar appearances, with a large tumor size and hypervascularity (Fig. 3).

From the histologic point of view, the characteris-

![Figure 1. Non-enhanced CT showing a huge hypodense soft tissue mass with central low density, similar to adjacent fat in attenuation, in the left lateral segment of liver.](image1)

![Figure 2. Post-contrast enhanced CT showing patchy strong peripheral enhancement of the mass, but no obvious enhancement is seen in the central hypodense area.](image2)

![Figure 3. Catheterization of the celiac trunk with tip in the distal proper hepatic artery a. The lesion was supplied by numerous engorged arteries arising from the left hepatic and left gastric arteries. b. The tumor stains persists until the venous phase.](image3a)

![3b](image3b)
tic mature fat cells of angiomyolipoma are quite different from fatty metamorphosis of hepatic cells in a hepatoma. Immunostaining yields a definitive diagnosis of hepatic angiomyolipoma. With the exception of one unusual case of hepatoblastoma with melanocytes, only angiomyolipoma among solitary hepatic tumors is positive for HMB-45, a melanoma specific antibody [8]. Moreover, staining with keratin markers is always negative in angiomyolipoma, whereas all hepatocyte-derived tumors (e.g., hepatocellular adenoma and carcinoma) and cholangiocarcinomas are positive.

Angiomyolipomas are benign tumors; therefore conservative clinical management is sufficient. Awareness of the image appearance may prevent the unwarranted surgical resection of benign angiomyolipomas. Even if a surgical resection is indicated, as in cases of vascular compression, disseminated intravascular coagulation, or hematoperitoneum, neither a large tumor margin nor lymphadenectomy are needed. When the fat content is high in composition, the imaging appearance of angiomyolipoma becomes quite characteristic. However, when the fat content is low, in addition to angiomyolipoma, the differential diagnosis should include any hypervascular liver tumor in a patient with a non-cirrhotic liver and without elevation of tumor markers.

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肝臟的血管肌肉脂肪瘤：病例報告

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血管肌肉脂肪瘤為不同比例之血管、平滑肌，及成熟脂肪所組成的良性腫瘤，常見於腎臟，位於肝臟則很罕見。我們報告一個63歲的女性病例，有著典型的電腦斷層及血管攝影影像；當遇到一不熟悉的肝腫瘤，有豐富的血管供應及脂肪組織，則必須把血管肌肉脂肪瘤列入鑑別診斷。

關鍵詞：血管肌肉脂肪瘤，肝腫瘤