

Adult Capillary Hemangioma of the Liver: Report of a Case

TAKEHIRO NODA¹, YO SASAKI¹, TERUMASA YAMADA¹, HIDETOSHI EGUCHI¹, KO TAKACHI¹, SHINGO NOURA¹, ISAO MIYASHIRO¹, KOHEI MURATA¹, YUICHIRO DOKI¹, HIROAKI OHIGASHI¹, OSAMU ISHIKAWA¹, SHINGI IMAOKA¹, HISASHI MITANI², and SHINGO ISHIGURO³

Departments of ¹Surgery, ²Radiology, and ³Pathology, Osaka Medical Center for Cancer and Cardiovascular Diseases, 1-3-3 Nakamichi, Higashinari-ku, Osaka 537-8511, Japan

Abstract

We report a rare case of capillary hemangioma of the liver in an adult. The patient was a 55-year-old man, admitted for investigation of a hepatic tumor. The tumor was seen as a hypoechoic mass with a peripheral hypoechoic ring on ultrasonography. Computed tomography (CT) showed an enhancement pattern different from that of hepatocellular carcinoma (HCC) or cavernous hemangioma. Ultrasonography-guided biopsy was technically very difficult because the tumor was located just below the diaphragm. We could not establish whether the tumor was HCC or cavernous hemangioma by the imaging findings, so we performed a hepatic resection. Histopathological examination confirmed a diagnosis of capillary hemangioma. Ultrasonography, CT, and magnetic resonance imaging showed an intermediate pattern between cavernous hemangioma and HCC. Thus, we must be aware of the possibility of capillary hemangioma when finding an atypical liver tumor inconsistent with HCC or cavernous hemangioma.

Key words Capillary hemangioma · Liver · Diagnosis · Adult · Benign tumor

Introduction

Hemangiomas are benign tumors, which have been pathologically classified into three varieties: capillary hemangioma, cavernous hemangioma, and mixed type hemangioma.¹ Most hemangiomas of the liver in adults are cavernous hemangiomas,² which are clearly distinct from hepatocellular carcinoma (HCC) on imaging examinations.^{3,4} Capillary hemangiomas mainly originate

from the orbital area and skin in the infantile period and often regress spontaneously.⁵ Because hepatic capillary hemangiomas are very rare, their clinical and pathological features are unclear, making a differential diagnosis from HCC or cavernous hemangioma very difficult. We report a case of hepatic capillary hemangioma in a 55-year-old man, and attempt to clarify the radiographic features and definitive points to distinguish capillary hemangioma from HCC or cavernous hemangioma.

Case Report

A 55-year-old man was admitted to Osaka Medical Center for Cancer and Cardiovascular Diseases for investigation of a mass in his liver. He had no specific family history, but had undergone a left nephrectomy for renal cell carcinoma 4 years earlier. Laboratory data showed positive antibodies for hepatitis C virus, but liver function tests and serum levels of the tumor markers, α -fetoprotein, protein-induced vitamin K-II, and carcinoembryonic antigen were all within the normal range.

Ultrasonographic (US) images showed a slightly hypoechoic and heterogeneous mass with a peripheral hypoechoic ring (halo), located in segment (S) 4 and S8 (Fig. 1). There was no evidence of a septum or a lateral shadow. The blood flow both in and around the tumor was unclear on color Doppler images. Plain abdominal computed tomography (CT) scans showed a mass with a low-density area, which was strongly enhanced in the dynamic early phase, and the enhancement became slightly weaker in the late phase (Fig. 2). An abdominal magnetic resonance imaging (MRI) scan showed a mass of low intensity in the T1-weighted images and high intensity in the T2-weighted images (Fig. 3). After intravenous injection of the contrast agent, the tumor was strongly enhanced in the early phase, and slightly

Reprint requests to: Y. Sasaki

Received: April 14, 2004 / Accepted: November 16, 2004

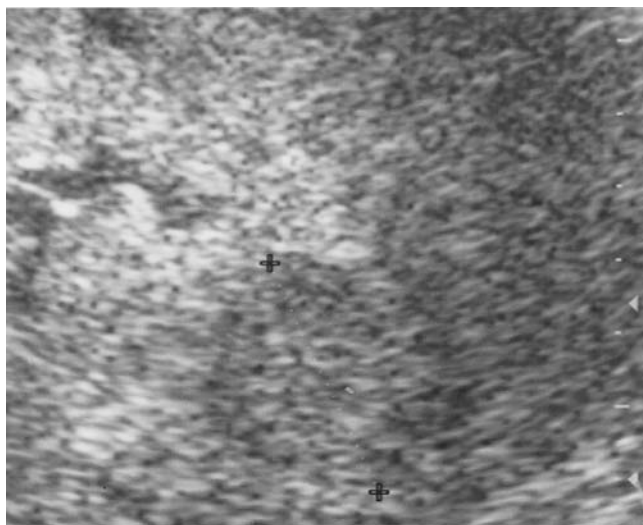


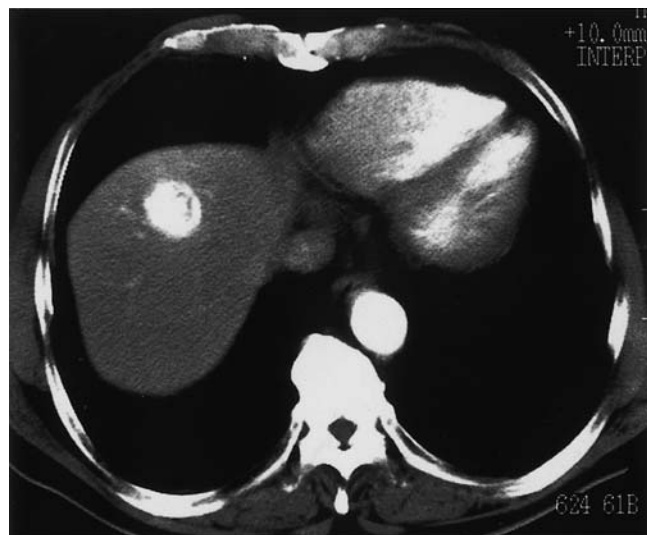
Fig. 1. Ultrasonography showed a hypoechoic mass with a peripheral hypoechoic ring, located in S4 and S8 of the liver

enhanced in the late phase. Selective angiography showed the tumor as well stained in the early phase, and the enhancement became clearer in the late phase. There was no evidence of pooling. As the tumor was atypical of tumors such as HCC, metastasis, focal nodular hyperplasia, or cavernous hemangioma, making a definitive diagnosis was very difficult. Therefore, we attempted to perform a US-guided biopsy, but because the tumor was located below the diaphragm, obtaining a specimen was very difficult. Since we could not exclude the possibility of malignancy, we performed partial hepatic resection of S4 and S8, with a cholecystectomy. The patient had an uneventful postoperative course and remains free of disease 3 years 6 months after the operation.

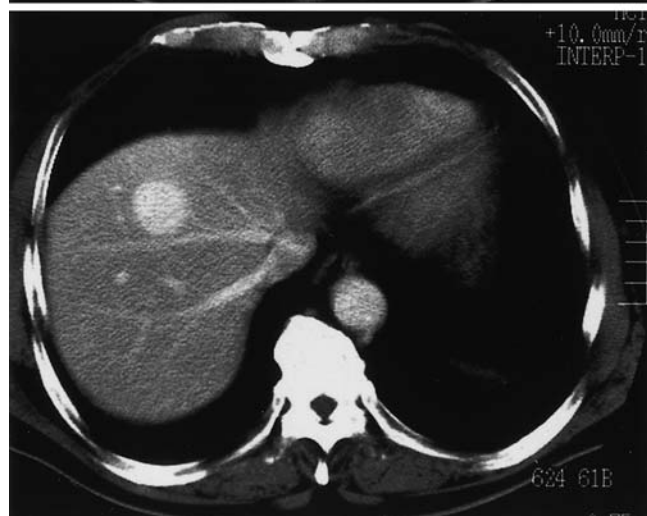
The resected tumor measured 22 × 20 mm and was reddish-brown with a clear boundary (Fig. 4). The tumor had relatively solid components, unlike cavernous hemangioma. Histological examination revealed the proliferation of blood vessels, which had a very small diameter of 20 μm. The cells had no heteromorphism of the nucleus and there were no malignant findings. The final histopathological diagnosis was capillary hemangioma (Fig. 5). Fibrous tissue, including bile ducts, was seen around the tumor. Chronic hepatitis was diagnosed by examination of the liver tissue.

Discussion

Hepatic hemangioma is characterized by capillary or cavernous growth resulting from a proliferation of blood vessels. Most hepatic hemangiomas are cavernous, whereas capillary hemangioma is very rare. In new-



a



b

Fig. 2. Computed tomography showed **a** a strongly enhanced tumor in the dynamic early phase, and **b** slightly weaker enhancement in the late phase

borns, capillary hemangioma of the liver was reported to be a symptom of diffuse neonatal hemangiomatosis⁶ or to accompany Kasabach–Merritt syndrome.⁷ To our knowledge, only two other cases of hepatic capillary hemangioma in an adult have been reported.^{8,9} The radiographic features of capillary hemangioma have yet to be defined, and establishing a definitive diagnosis of capillary hemangioma from HCC and cavernous hemangioma is very difficult. Both of the previous cases were diagnosed by histological examination at the time of percutaneous biopsy or resection.

We compared the radiographic findings of the three cases reported in Japan with those of HCC and cavernous hemangioma of the liver (Table 1). Ultrasonography shows capillary hemangioma as a clearly defined mass, with a varied internal echo pattern. A peripheral

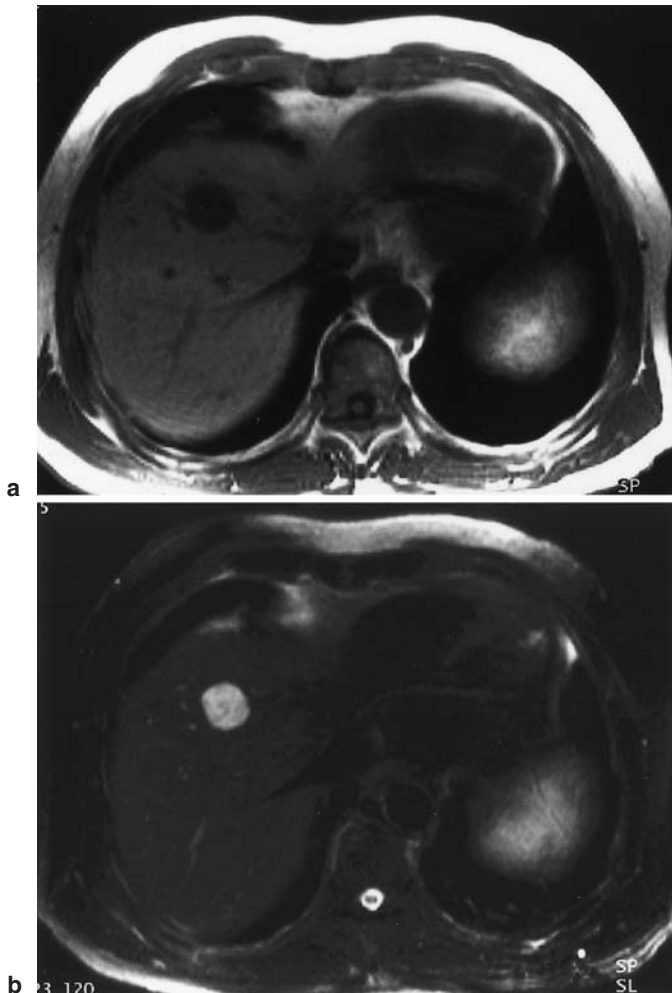


Fig. 3. Magnetic resonance imaging showed **a** a mass of low intensity in the T1-weighted images, and **b** a mass of high intensity with heterogeneous internal signals in the T2-weighted images

hypochoic ring, or “halo,” which is characteristic of HCC,^{10,11} was seen in two patients. Thus, a halo is considered to correspond to a pseudocapsule of HCC pathologically.¹² Histological examination of the tumor from our patient revealed fibrous tissue like a pseudocapsule around the capillary hemangioma.

Noncontrast CT scans show capillary hemangioma as a well-defined lesion of low homogeneous density, whereas contrasting CT scans show a mass that is strongly and homogeneously enhanced in the early phase, with varied enhancement patterns in the late phase. The frequency of patterns of peripheral enhancement, and of fill-in or prolonged enhancement, is lower in capillary hemangiomas than in cavernous hemangiomas.

On angiography, capillary hemangiomas are enhanced in the early phase and the enhancement contin-



Fig. 4. Resected specimen showing a tumor, 22 × 20mm in size, which was reddish-brown with a clear boundary

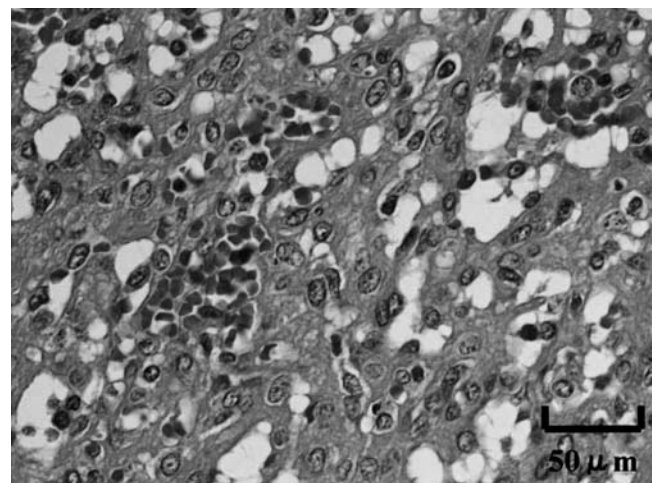


Fig. 5. Histological examination revealed the proliferation of blood vessels with a diameter of 20 μ m. The cells had no heteromorphism of the nucleus and there were no malignant findings. The final histopathological diagnosis was capillary hemangioma ($\times 100$)

ues until the late phase. This pattern of enhancement is different from that seen in HCC, but pooling, which is characteristic of cavernous hemangioma,¹³ is not seen. The radiographic pattern of capillary hemangioma seems to be an intermediate pattern between that of cavernous hemangioma and that of HCC. We assume that capillary hemangiomas show this intermediate radiographic pattern for the following reasons: first, because the blood vessels in capillary hemangioma are so small, with a diameter of 20 μ m, the blood-flow rate is

Table 1. Radiographic features of hepatocellular carcinoma, cavernous hemangioma, and capillary hemangioma

	Hepatocellular carcinoma	Cavernous hemangioma	Capillary hemangioma		
			Case 1 ⁸	Case 2 ⁹	Present case
Internal echo	Mosaic pattern	Hyperecho	Mosaic pattern, hyperecho	Mixed	Hypoecho
Peripheral hypoechoic ring "halo"	(+)	(-)	(+)	(-)	(+)
CT plain-early-late	Low-high-low	Low-high-high	Low-high-iso	Low-high-high	Low-high-high
MRI T1W-T2W	Low-high	Low-very high	High-high	NA	low-high
Dynamic MR early-late	High-low	High-high	NA	NA	high-high

CT, computed tomography; MRI, magnetic resonance imaging; NA, not available

increased, so the contrast agent does not stay in the tumor or go through earlier than in cavernous hemangioma; second, because capillary hemangioma has relatively solid components surrounded by fibrous tissue, the internal echo level is decreased, creating an image of a peripheral hypoechoic ring (corresponding to the fibrous tissue around the tumor). Thus, the possibility of capillary hemangioma should be considered in the differential diagnosis of any liver tumor atypical of HCC or cavernous hemangioma.

References

- Gentry RW, Dokerty MB, Clagett OT. Vascular malformation and vascular tumors of the gastrointestinal tract. In: International abstracts of surgery. Chicago: The Franklin H. Martin Memorial Foundation; 1949. p. 281–323.
- Ishack KG, Rabin L. Benign tumors of the liver. *Med Clin North Am* 1975;59:995–1013.
- Itai Y, Furui S, Araki T, Yashiro N, Tasaka A. Computed tomography of cavernous hemangioma of the liver. *Radiology* 1980;137:149–55.
- Freeny PC, Marks WM. Patterns of contrast enhancement of benign and malignant hepatic neoplasms during bolus dynamic and delayed CT. *Radiology* 1986;160:613–8.
- Haik BG, Karcioğlu ZA, Gordon RA, Pechous BP. Capillary hemangioma (infantile periocular hemangioma). *Surv Ophthalmol* 1994;38:399–426.
- Satoh H, Kinukawa N, Kishimoto H, Ogawa Y, Shuro F. An autopsy case of diffuse neonatal hemangiomatosis (in Japanese with English abstract). *Saitama Syouni Iryou Center Ishi* 1994;11:23–7.
- Akiyoshi K, Mizote H, Tanaka Y, Nakagawa M. Capillary hemangioma of the liver with Kasabach-Merritt syndrome in a neonate: report of a case. *Surg Today* 2000;30:86–8.
- Kojima K, Tamano M, Oguma M, Matsumura A, Kuniyoshi T, Sugaya H, et al. Hepatic benign tumor with hepatocellular carcinoma like appearance on image diagnosis (in Japanese with English abstract). *Liver Cancer* 2000;6:70–4.
- Matsuo N, Uchida H. A case of hepatic capillary hemangioma with difficulty of definitive diagnosis from hepatocellular carcinoma (in Japanese). *Nichidoku-ihou* 1990;35:66–7.
- Wernecke K, Vassallo P, Bick U, Diederich S, Peters PE. The distinction between benign and malignant liver tumors on sonography: value of a hypoechoic halo. *Am J Roentgenol* 1992;159:1005–9.
- Shinagawa T, Ohto M, Kimura K, Tsunetomi S, Morita M, Saisho H, et al. Diagnosis and clinical features of small hepatocellular carcinoma with emphasis on the utility of real-time ultrasonography. A study of 51 patients. *Gastroenterology* 1982;86:495–502.
- Jinzaki M, Ido K, Hiramatsu K, Kakumoto Y. A case report of liver hemangioma which was difficult to make a differential diagnosis from hepatocellular carcinoma. Comparative study between a halo on ultrasonography and pathological finding. *Liver Cancer* 1995;1:17–21.
- Johnson CM, Sheedy PF II, Stanson AW, Stephens DH, Hattery RR, Adson MA. Computed tomography and angiography of cavernous hemangiomas of the liver. *Radiology* 1981;138:115–21.