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Peliosis hepatis with pseudotumoral and hemorrhagic evolution: CT and MR findings

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Abstract
Peliosis hepatis is an uncommon benign disorder characterized by blood-filled cavities within the liver. We describe the sonographic, computed tomographic, and magnetic resonance appearance of a patient affected by peliosis hepatis with pseudotumoral and hemorrhagic evolution and direct demonstration of the ectatic vascular components.

Key words: Liver, hemorrhage—Liver, CT—Liver, MR.

Peliosis hepatis is an unusual benign disorder that was first described by Schoenlank in 1916 and is characterized by multiple blood-filled spaces communicating with dilated sinusoids [1–3]. The cavities show variable size and morphology. Peliosis may also affect other organs such as the spleen, lymph nodes, bone marrow, lungs, pleura, kidneys, adrenals, stomach, and ileum [4]. Previously associated with chronic wasting due to tuberculosis, cancer, or hematologic disorders, peliosis hepatis has also been reported in patients treated with anabolic steroids and oral contraceptives [5]. Peliosis hepatis may be asymptomatic or complicated by liver failure, cholestasis, portal hypertension, hemorrhage, and, rarely, hemoperitoneum [5–7].

The imaging features of uncomplicated and hemorrhagic peliosis have been reported [1, 5–12]. However, to our knowledge, the pseudotumoral appearance of this entity with direct demonstration of the ectatic vascular components has never been described. We report the sonographic, computed tomographic (CT), and magnetic resonance (MR) appearances of peliosis hepatis with pseudotumoral and hemorrhagic evolution.

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Case report

A 35-year-old woman presented with right abdominal pain. She had used oral contraceptives for many years. Physical examination showed slight hepatomegaly. Laboratory findings were unremarkable. Ultrasound examination showed biliary sludge, hepatic steatosis, and multiple macronodular hypoechoic lesions, the largest of which was located near the gallbladder. A liver helical CT examination (Somatom Plus 4 scanner, Siemens, Erlangen, Germany) with 5-mm collimation and a pitch of 1 showed fatty liver and multiple lesions with regular shape that were hyperdense before and after intravenous administration of contrast medium (120 mL Iopremole, Iomeron 300, Bracco, Italy).

The T2-weighted and fat-suppressed MR images obtained on a 1.5-T MR unit (Vision, Siemens) demonstrated slightly hyperintense lesions, with no evidence of portal vein thrombosis, distortion, or infiltration, which suggested pseudotumoral hepatic steatosis; these results were confirmed by fine-needle aspiration. A 6-month sonographic follow-up demonstrated progressive increase in size of the lesions.

Two years later the patient presented with acute right abdominal pain. Enhanced CT confirmed the preexisting macronodular pattern, showing a large subcapsular blood collection and the presence of an inhomogeneously hypodense tumor in the caudal aspect of the right liver (Fig. 1A).

Sagittal T1-weighted (Fig. 1B) and coronal T2 (Fig. 1C) MR images confirmed the hemorrhagic nature of the collection and better demonstrated the exophytic growth of the caudal lesion, which appeared hypointense on T1 images and slightly hyperintense on T2 images. Contrast-enhanced fat-suppressed T1 delayed (60 min) images obtained after injecting gadobenate dimeglumine (Multihance, Bracco, Italy) at a dose of 0.1 mmol/kg showed a

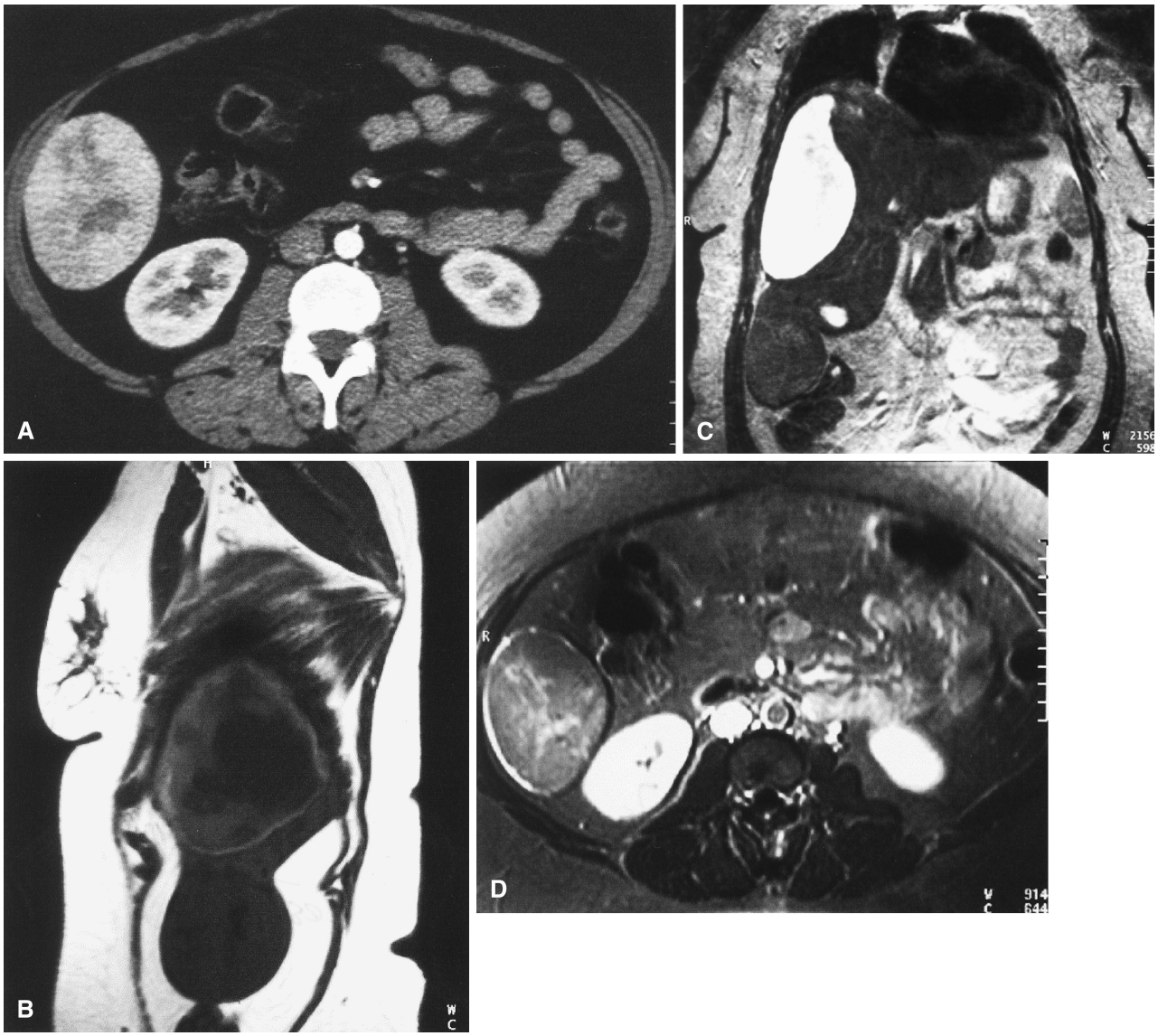

Fig. 1. A Enhanced CT demonstrates an inhomogeneously hypodense tumor in the caudal aspect of the right liver. Other sections (not shown) demonstrated a large right subcapsular blood collection and a nodular lesion in the medial aspect of the left liver. (**B**) Sagittal T1 and (**C**) coronal T2 and T1 MR images confirm the hemorrhagic nature of the collection and demonstrate a small intraparenchymal hematoma (**C**). Sagittal and coronal views better depicted the exophytic growth of the caudal lesion, which appears homogeneously hypointense on T1 (**B**) and slightly hyperintense on T2 (**C**). **D** The lesion is characterized by a "branching" appearance caused by the vascular component as demonstrated on T1 fat-suppressed delayed enhanced images.

"branching" appearance (Fig. 1D) caused by the direct demonstration of the vascular component within the lesion. Fine-needle biopsy demonstrated the presence of diffuse steatosis and showed blood-filled spaces with no endothelial lining, characteristic of the parenchymal type of peliosis hepatis.

Discussion

Peliosis hepatis is characterized by multiple blood-filled cavities [13] that are variable in morphology and size (from smaller than 1 mm to several centimeters), with no preferential location within the hepatic lobule [1]. Yanoff and Rawson described two types of the disease: parenchymal and phlebectatic [14]. In the parenchymal type, the blood-filled spaces are lined with hepatocytes and are usually associated with hemorrhagic parenchymal necrosis; in the phlebectatic type, the spaces are lined with endothelium and based on aneurysmal dilatation of the central vein [14].

Although the pathogenesis remains unknown, many theories have been postulated to explain the etiology of the disease such as toxic or infectious damage on the

sinusoidal endothelium, outflow obstruction of blood flow at the sinusoidal level, and hepatocellular necrosis [15]. Peliosis is associated with tuberculosis, steroid and oral contraceptives therapies, hematologic and hepatic disorders, and neoplasms [3, 8, 11, 13, 16, 17].

Bacillary peliosis hepatis has been reported in HIV-positive patients [5]; the causative agents for cutaneous bacillary angiomatosis and HIV-related peliosis are *Rochalimaea henselae* and *R. quintana*, two Rickettsia-like organisms [18–20]. Although bacillary angiomatosis is most frequently located in the skin, it has also been described in bone, in the reticuloendothelial system (liver, spleen, lymph nodes), and in bone marrow, kidneys, adrenals, pleura, and retroperitoneum [19–22].

Several reports have reported regression of peliosis hepatis after cessation of steroid therapy or resolution of the associated infectious disease [8].

Clinical presentation is variable. The disease may be asymptomatic or present with complications such as liver failure, cholestasis, portal hypertension, or hemorrhage [5].

Imaging findings in peliosis hepatis are variable depending on different pathologic patterns of the disease and often concomitant steatosis. Ultrasound generally shows homogeneous hypoechoic lesions (in patients with steatosis) but has also shown heterogeneous hypoechoic (complicated with hemorrhage) or hyperechoic (in patients with normal liver) patterns [10]. CT findings differ with the size of the lesions, the extent of communication with sinusoids, the presence or absence of thrombus within the cavity, and the presence of hemorrhage. The lesions are generally hypodense before and after administration of intravenous contrast medium. If peliotic cavities are much smaller than 1 cm in diameter, CT findings may appear normal. Larger cavities that communicate with sinusoids will have the same attenuation characteristics as blood vessels, and thrombosed cavities will have the same appearance as nonenhancing nodules [1, 9]. MR findings of uncomplicated peliosis hepatis seem normal [1] or show lesions with increased signal on T1- and T2-weighted images due to the presence of subacute blood [8].

The differential diagnosis must take into account primary or metastatic neoplasms, hematologic disorders, and hepatic abscess [5, 8, 10].

Within 2 years, our patient who initially presented with steatosis developed hemorrhagic and pseudotumoral complications of peliosis hepatis. The macronodular appearance in a HCV-positive patient with chronic hepatic disease may have suggested dysplasic nodule or hepatocellular carcinoma. The strong contrast enhancement with the "branching" appearance caused by the vascular components on fat-suppressed T1-weighted images in the delayed phase after administration of gadobenate dimeglumine seems to be specific.

In conclusion, peliosis hepatis should be considered in the differential diagnosis of a hepatic mass. Enhanced MR may the modality to diagnose it.

References

1. Jamadar DA, D'Souza SP, Thomas EA, et al. Case report: radiological appearances in peliosis hepatis. *Br J Radiol* 1994;67:102–104
2. Shoenlank FW. Ein Fall von Peliosis hepatis. *Virchows Arch* 1916; 222:358–364
3. Zak FG. Peliosis hepatis. *Am J Pathol* 1950;26:1–15
4. Ichijima K, Kobashi Y, Yamabe H, et al. Peliosis hepatis: an unusual case involving multiple organs. *Acta Pathol Jpn* 1980;30: 109–120
5. Vignaux O, Legmann P, de Pinieux G, et al. Hemorrhagic necrosis due to peliosis hepatis: imaging findings and pathological correlation. *Eur Radiol* 1999;9:454–456
6. Takiff H, Brems JJ, Pockros PJ, et al. Focal hemorrhagic necrosis of the liver. A rare case of hemoperitoneum. *Dig Dis Sci* 1992;37: 1910–1914
7. Smathers RL, Heiken JP, Lee JKT, et al. Computed tomography of fatal hepatic rupture due to peliosis hepatis. *J Comput Assist Tomogr* 1984;8:768–769
8. Maves CK, Caron KH, Bisset GS, et al. Splenic and hepatic peliosis: MR findings. *AJR* 1992;158:75–76
9. Radin DR, Kanel GC. Peliosis hepatis in a patient with human immunodeficiency virus infection. *AJR* 1991;156:91–92
10. Colagrande S, Tonarelli A, Leone F. Peliosis hepatis: US, CT and MR findings. Report of two cases. *Radiol Med* 1995;89:897–900
11. Pliskin M. Peliosis hepatis. *Radiology* 1975;114:29–30
12. Radin DR. Spontaneous resolution of peliosis of the liver and spleen in a patient with HIV infection. *AJR* 1992;158:1409
13. Simon DM, Krause R, Galambos JT. Peliosis hepatis in a patient with marasmus. *Gastroenterology* 1988;95:805–809
14. Yanoff M, Rawson AJ. Peliosis hepatis. *Arch Pathol* 1964;77:159–165
15. Bagheri SA, Bojer JL. Peliosis hepatis associated with androgenic–anabolic steroid therapy: a severe form of hepatic injury. *Ann Intern Med* 1974;81:610–618
16. Van Erpecum KJ, Janssens AR, Kreuning J, et al. Generalised peliosis hepatis and cirrhosis after long-term use of oral contraceptives. *Am J Gastroenterol* 1988;83:572–575
17. Walter E, Mockel J. Images in clinical imaging: peliosis hepatis. *N Engl J Med* 1997;337:1603
18. Relman DA, Loutit JS, Schmidt TM. Peliosis hepatis: old disease, new cause. *Gastroenterology* 1991;101:864–866
19. Kunberger LE, Montalvo BM. Bacillary angiomatosis in the abdomen: Doppler and CT features. *J Comput Assist Tomogr* 1994;18: 308–309
20. Cotell SL, Noskin GA. Bacillary angiomatosis: clinical and histologic features, diagnosis, and treatment. *Arch Intern Med* 1994;154: 524–528
21. Coche E, Beigelman C, Lucidarme O, et al. Thoracic bacillary angiomatosis in a patient with AIDS. *AJR* 1995;165:56–58
22. Baron AL, Steinbach LS, Le Boit PE, et al. Osteolytic lesions and bacillary angiomatosis in HIV infection: radiologic differentiation from AIDS-related Kaposi sarcoma. *Radiology* 1990;177:77–81