Hepatic infarction: MRI appearance

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■ Because the liver is supplied with portal venous as well as hepatic arterial blood, hepatic infarction is a rare occurrence. Prior to the use of computed tomography (CT), ante mortem diagnosis of this entity was unusual. The CT findings in liver infarction have been described. However, the magnetic resonance imaging (MRI) appearance has not been well characterized or illustrated. We present the CT and MRI findings of a biopsy-proven case of hepatic infarction.

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A 67-YEAR-OLD female presented with nausea, vomiting, anemia, and melanotic stools. Upper and lower endoscopy were negative. The patient developed leukocytosis and small bowel obstruction, was taken to surgery, and was found to have occlusion of the superior mesenteric artery and extensive bowel infarction. Following extensive bowel resection, the patient did well until postoperative day 13, when she became febrile. Contrast-enhanced CT demonstrated a large, geographic low-attenuation lesion within the right lobe of the liver, containing a small amount of gas (*Figure 1*).

Due to the presence of gas on the CT examination, a diagnosis of hepatic abscess was entertained and percutaneous aspiration attempted. Scant fluid was obtained, so a biopsy study of the lesion was performed. Tissue for both culture and histologic examination was obtained. The cultures were negative. A final pathologic diagnosis of liver infarction with periportal inflammation was made.

Two weeks later, the liver was examined by MRI. T1-weighted images demonstrated a wedge-shaped diminished-signal lesion in the periphery of the right lobe of the liver (*Figure 2*). The lesion was better demonstrated on the T2-weighted images and was of increased signal (*Figure 3*). The wedge-shaped nature of the lesion was better demonstrated by MRI. The location corresponded to that of the lesion seen on CT.

A follow-up CT was performed 75 days later and demonstrated a persistent wedge-shaped low-attenuation lesion (*Figure 4*).

DISCUSSION

Because of its dual vascular supply, infarction of the liver is a rare event. Hepatic infarction is almost always the result of thrombosis, embolism, or other compromise of an intrahepatic branch of the hepatic artery.[1] It also can be seen in polyarteritis nodosa.[2,3] Hepatic infarction has not been shown to be secondary to portal venous occlusion alone.[1]

The CT appearance of hepatic infarction has been described.[4-7] Infarcts present as low-attenuation, wedge-shaped lesions in the periphery of the liver on

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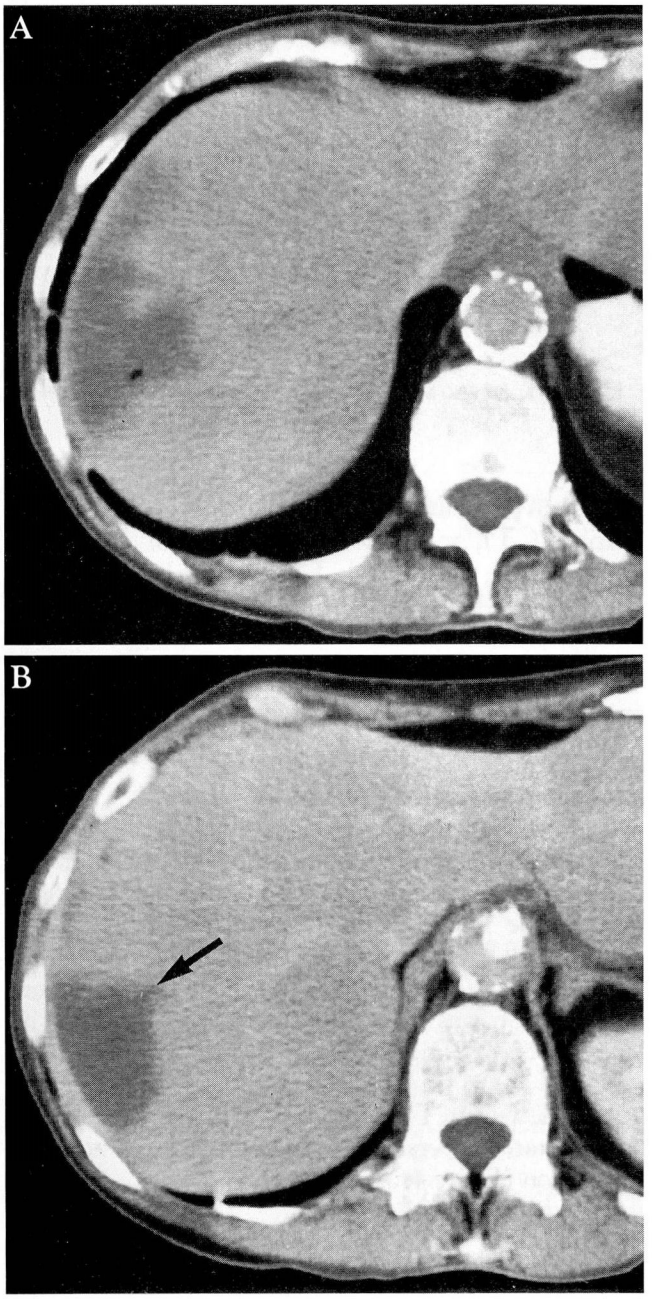

FIGURE 1. Contrast-enhanced CT scan of the liver (A) demonstrates a low-attenuation lesion in the periphery of the right lobe which contains a small focus of gas. The image (B) obtained through the liver at a lower level demonstrates the same lesion.

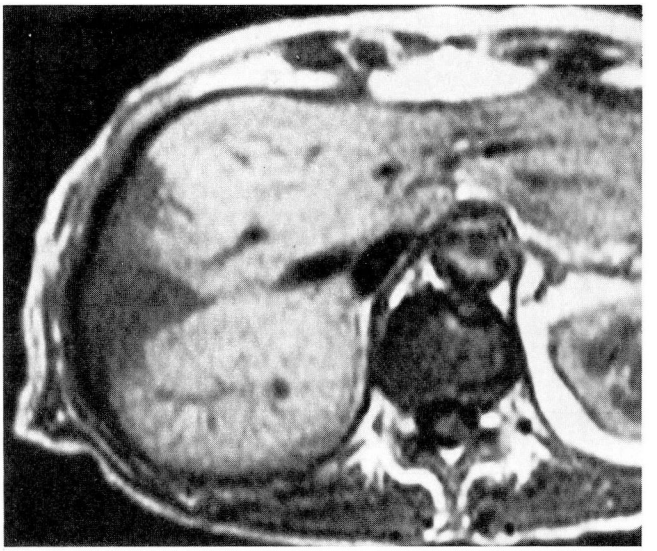

FIGURE 2. T1-weighted spin-echo image (TR = 312 msec, TE = 24 msec) demonstrates a remarkably wedge-shaped low-signal lesion in the right hepatic lobe corresponding to the defect seen on CT (see Figure 1a). (TR, repetition time; TE, echo time)

contrast-enhanced CT images. On pre-contrast images, these lesions may be isodense (equal in density to surrounding normal liver parenchyma) with remaining liver.[6] Fresh infarcts may have a rounded appearance, thus mimicking other space-occupying lesions such as abscess.[7]

The MRI appearance of hepatic infarction has not been well characterized in the literature. Schertz et al[8] reported, but did not describe or illustrate, a single hepatic infarct seen by MRI. In their case, the lesion was not seen on T1-weighted spin-echo images, but on proton spectroscopic and T2-weighted images. Although the hepatic infarct we present was well seen on T1-weighted images, it was more conspicuous on the T2-weighted scan. Most pathologic conditions of the liver, both benign and malignant, will produce prolongation of the T1 and T2 relaxation times (decreased signal on T1- and increased signal on T2-weighted images). A notable exception is focal fatty infiltration of the liver, which produces T1 shortening. Thus, the MRI signal characteristics of hepatic infarction are relatively nonspecific. In this case, however, MRI demonstrates the wedge-shaped nature of the lesions to better advantage than CT. MRI also confirms the patency of the portal and hepatic veins; this information may be helpful in clinical decision-making. The more detailed morphologic information obtained by MRI may, in the appropriate clinical setting, suggest the diagnosis of hepatic infarction.

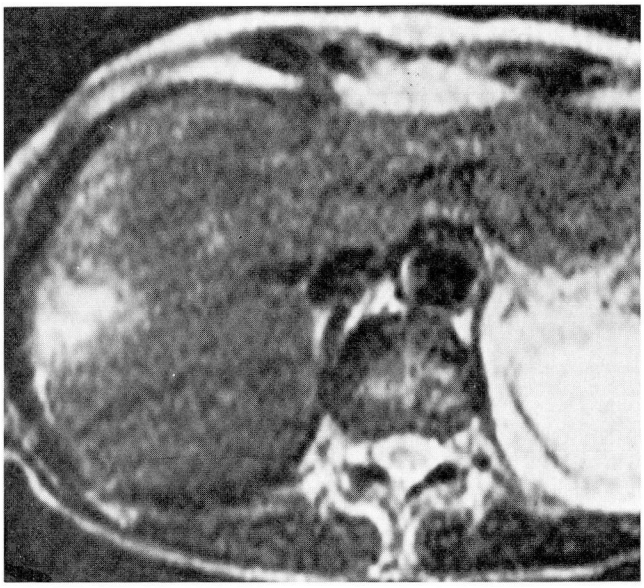

FIGURE 3. T2-weighted spin-echo image (TR = 2500 msec, TE = 80 msec) demonstrates a high-signal lesion. (TR, repetition time; TE, echo time)

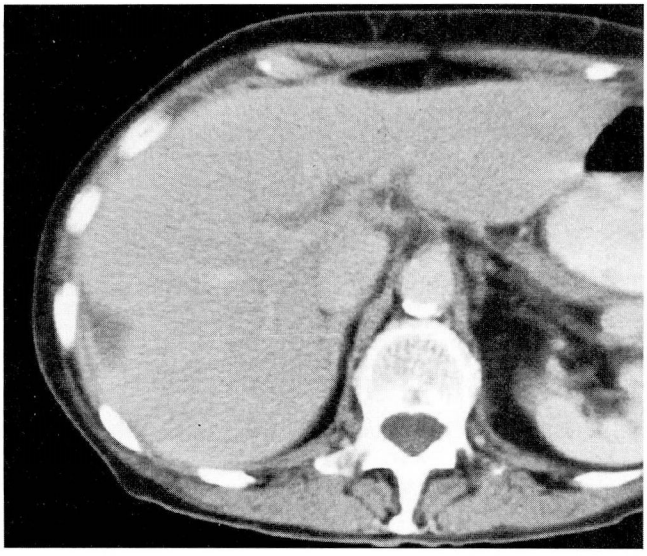

FIGURE 4. Contrast-enhanced CT scan obtained 75 days later shows a wedge-shaped lesion similar to that seen in the earlier MRI study.

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