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Figure 1. Ultrasound of the liver.

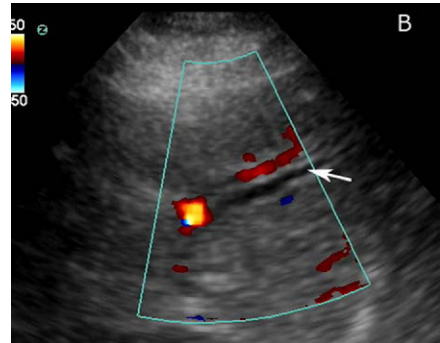


Figure 2. Ultrasound magnified over the liver with color Doppler.



Figure 3. Magnetic resonance cholangiography. Used with permission of William T. Hosek, MD, Johns Hopkins University, Baltimore, MD.

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A 23-year-old woman with a history of a cholecystectomy 3 years earlier presented with intermittent abdominal pain for 3 days. On physical examination, she was afebrile and had a pulse of 100 beats/min, respiratory rate of 20 breaths/min, blood pressure of 120/70 mm Hg, and a room air oxygen saturation of 98%. She had a soft abdomen with normal bowel sounds and moderate tenderness in the epigastric area. The patient's WBC count, liver transaminase, serum bilirubin, alkaline phosphatase, amylase, and lipase levels were all normal. Figures 1 and 2 are from her bedside ultrasonogram and were taken with the probe held in a transverse orientation just below the xiphoid. Figure 3 is from her magnetic resonance cholangiography, performed the following morning.

For the diagnosis and teaching points, see page 336.

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(continued from p. 328)

DIAGNOSIS:

Cholelithiasis. The intrahepatic “parallel channel sign” (Figure 1) is the appearance on ultrasonography of 2 anechoic structures running in parallel within the liver. Normally, only a single channel, a branch of the main portal vein, is observed. In the presence of biliary obstruction, intrahepatic branches dilate and become visible with ultrasonography. The parallel channel sign is best demonstrated in transverse sections of the left hepatic lobe, beginning just below the xyphoid.¹ Figure 2 is a color Doppler image of the 2 channels. Color Doppler is used to differentiate a dilated intrahepatic duct from an enlarged arterial branch that may occur in some cases of nonbiliary liver disease.² The sonographic findings of biliary obstruction preceded the increase of liver enzymes by several hours. The magnetic resonance cholangiography performed the following morning revealed a 5-mm stone in her distal common bile duct (Figure 3). She was referred for endoscopic stone extraction.

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