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Part 1
Hepatobiliary

1

Case 1

Rocky C. Saenz

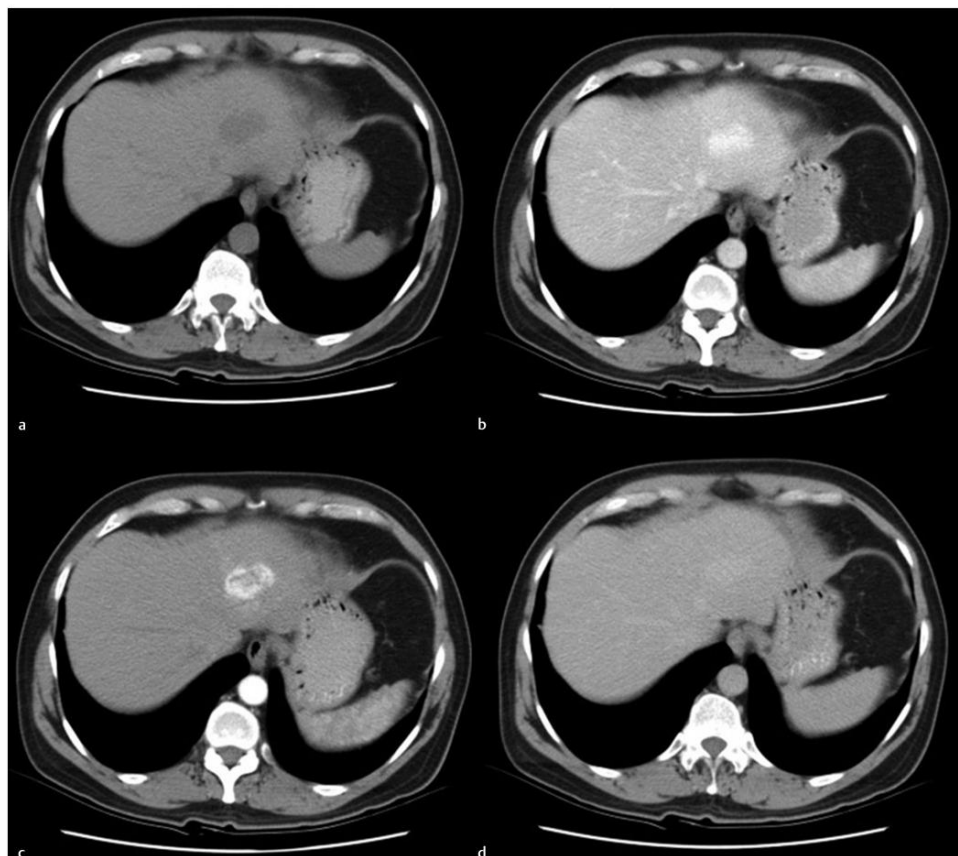


Fig. 1.1 Unenhanced axial CT image (a) demonstrates a hypodense mass within the left lobe. The mass demonstrates peripheral nodular enhancement on arterial phase imaging with a central hypodense scar (b). On venous phase imaging (c), the mass is hyperdense to surrounding hepatic parenchyma. On delayed imaging (d), the lesion is isodense to the surrounding hepatic parenchyma.

■ Clinical History

A 26-year-old woman with intermittent discomfort (► Fig. 1.1).

■ Key Finding

Liver mass with peripheral nodular enhancement.

■ Top 3 Differential Diagnoses

- **Hemangioma:** Hemangiomas are the most common benign lesion with incidence reported as high as 20% in the general population. The classic imaging findings are initial progressive peripheral nodular enhancement in the arterial phase which on delayed imaging becomes isodense to the surrounding liver parenchyma. On MRI, hemangiomas are hyperintense on T2 (light bulb sign) and hypointense on T1-weighted imaging with similar enhancement patterns as seen with CT. On ultrasound, most hemangiomas are well circumscribed hyperechoic lesions.
- **Focal nodular hyperplasia (FNH):** FNH is an uncommon hepatic lesion with a 5% incidence in the general population. The lesion is composed of hepatocytes and classically contains

a central low-density scar. On MRI, FNH is intermediate to low signal on T2 with a bright central scar. Since FNH is composed of hepatocytes, it demonstrates enhancement on delayed intracellular imaging (with gadoxetate disodium), which is helpful in distinguishing FNH from other hepatic lesions.

- **Hepatic adenoma:** Hepatic adenomas are benign lesions predominantly seen in women (90%). Most often they are solitary but may occasionally be multiple, especially in patients with glycogen storage disease. There is an association with oral contraceptive use. Hepatic adenomas have a variable contrast enhancement pattern. Adenomas are typically hypervascular; internal hemorrhage can lead to heterogeneity. The minority of cases may have macroscopic fat and calcifications.

■ Additional Diagnostic Considerations

- **Hepatocellular carcinoma (HCC):** HCC is the most common visceral malignancy in the world. The most common etiology is cirrhosis. The lesions are typically hypodense and demonstrate increased arterial phase enhancement due to blood supply from the hepatic artery. Portal or hepatic vein invasion is common. MRI can be helpful in these instances since HCC typically displays increased T2 signal intensity. Clinically, HCC

is associated with elevated alpha-fetoprotein (poor prognosis with average survival time of 6 months).

- **Metastases:** Metastases are usually multiple but may present as a solitary lesion. Tumors that classically metastasize to liver commonly include lung, breast, melanoma, colon, and pancreas. On contrast-enhanced imaging, metastases have a variable appearance.

■ Diagnosis

Hemangioma.

✓ Pearls

- Hemangiomas demonstrate peripheral, nodular, enhancement, which becomes isodense to liver.
- A hepatic lesion with portal or hepatic vein invasion is HCC until proven otherwise.

- Hepatic adenomas are associated with oral contraceptives.

Suggested Readings

Federle MP, Jeffrey RB, Woodward PJ, Borhani A. Diagnostic Imaging: Abdomen. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2009

Kamel IR, Lawler LP, Fishman EK. Comprehensive analysis of hypervascular liver lesions using 16-MDCT and advanced image processing. *AJR Am J Roentgenol*. 2004; 183(2):443–452

Saenz RC. MRI of benign liver lesions and metastatic disease characterization with gadoxetate disodium. *J Am Osteopath Coll Radiol*. 2012; 1(4):2–9

Case 2

Zophia Martinez

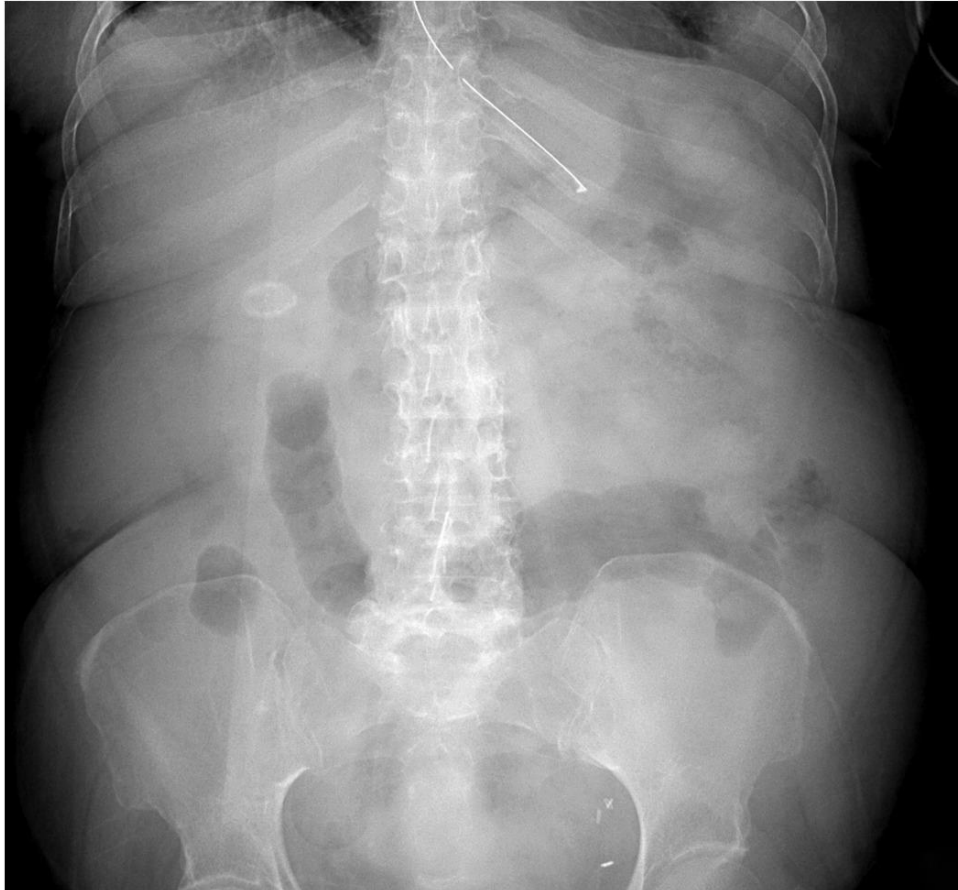


Fig. 2.1 Frontal radiograph of the abdomen demonstrates a round, peripherally dense calcification in the right upper quadrant. An enteric tube is seen overlying the stomach.

■ Clinical History

A 57-year-old female with occasional postprandial pain (► Fig. 2.1).