Diagnostic Snapshot

Is This Patient's Liver Mass Cancer?

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Authors' disclosures of conflicts of interest are found at the end of this article.
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Abstract

Undiagnosed liver lesions are important findings that can affect the physical and mental well-being of patients. They are usually incidental findings identified while clinicians are performing other imaging tests. It is important for clinicians and patients to identify the causative factors for these lesions in order to further reduce risk, develop treatment plans, and produce better outcomes. Both men and women can develop liver lesions, which may require surgical intervention. Knowing the key risk factors for common lesions can help clinicians confidently diagnose patients without costly workup.

HISTORY

Ms. BP is a 38-year-old female with a past medical history significant for multiple sclerosis who has been receiving high-dose glucocorticoids and rituximab (Rituxan) treatments for the past 12 years. For the past couple of years, she has been followed by a gastroenterologist for symptoms of gastroparesis. Additional medical history includes a long-standing history of hypothyroidism, morbid obesity, depression, obstructive sleep apnea, polycystic ovarian syndrome (PCOS), hypertension, cataracts, gastroesophageal reflux disease, tachycardia, and fatty liver. She reports a previous history of tobacco dependency and sporadic mild alcohol consumption.

Approximately 8 months ago, she developed elevated liver enzymes and right upper quadrant discomfort. A CT of the abdomen demonstrated fatty infiltration of the bowel wall in the ileocecal region extending into the ascending and transverse colon. The right liver demonstrated a 5.8 × 3.5 cm mass in the posterior aspect of the right hepatic lobe that appeared hypodense but with evidence of internal vascularity. The gallbladder was surgically absent. The remainder of the CT scan showed no other significant finding.

Due to the abnormal bowel findings, Ms. BP was referred to gastroenterology for a colonoscopy, which revealed no evidence of colon polyps or masses. Further evaluation of the terminal ileum with an ileoscopy up to 15 cm was also unremarkable. She was recommended to undergo a CT-guided biopsy of the right liver mass, but decided to seek a referral with a hepatobiliary surgeon for further evaluation.

CHIEF COMPLAINT

Ms. BP presented to the surgical oncology clinic with a history of right upper quadrant pain that extended to the right flank and midlumbar regions. She described her pain as intermittent and sharp, with a pain intensity level of 6/10. She reported that the pain can even occur at rest. She also reported fatigue, abdominal distention, early satiety, weight gain, diarrhea, nausea, and vomiting.

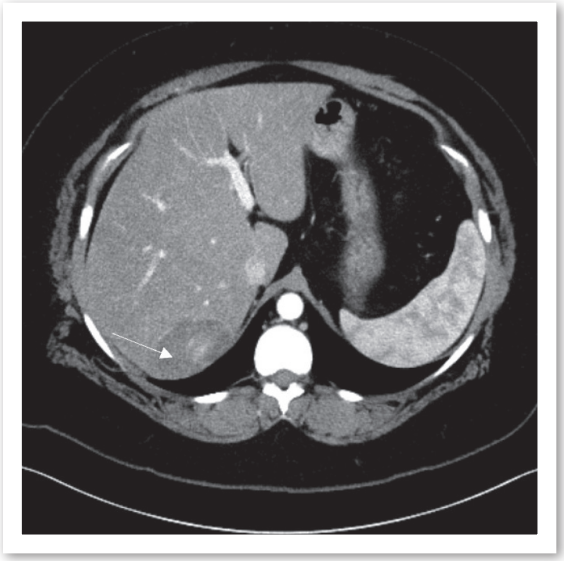

Figure 1

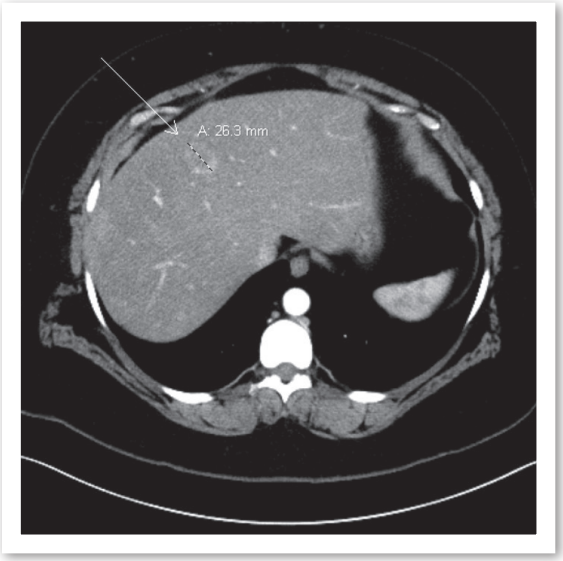

Figure 2

Ms. BP has a history of tobacco use, which includes an 11 pack-year smoking history; she quit smoking 9 years prior to this visit. She uses alcohol infrequently. She denied any illicit drug use. She is not currently sexually active; however, she reported an 11-year history of oral birth control use. She discontinued birth control use in 2008. She has been disabled since 2010 due to her multiple sclerosis. Her family history is only significant for papillary thyroid cancer involving two first-degree relatives. She has no immediate family history of cancer or other significant chronic illnesses or diseases.

PHYSICAL EXAMINATION

On physical examination, Ms. BP was a well-nourished obese female of stated age in no acute distress. Vital signs were a temperature of 36.7°C, heart rate of 94 bpm, respiratory rate of 20, blood pressure of 123/65, and a weight of 269 lb. Lung sounds were clear to auscultation. An abdominal exam revealed a large, obese abdomen. Tenderness on palpation was noted in the right upper quadrant that radiates to the back. No hepatosplenomegaly was demonstrated. Normal active bowel sounds were present. Cardiac exam was unremarkable. Her skin was warm and dry. She had a full range of motion of all extremities. Laboratory analyses revealed mild leukocytosis with a white blood count of 11.7 K/µL and mild anemia with a hemoglobin of 11.5. Her pertinent metabolic panel demonstrated an alpha-fetoprotein of 2.5 ng/mL, carcinoembryonic antigen of 0.7 ng/mL, CA 19-9 of 3.5 U/mL, total bilirubin of 0.3 mg/dL, alanine aminotransferase of 75 U/L, and aspartate aminotransferase of 63 U/L.

To further characterize her liver lesions radiographically, a multiphasic CT with liver protocol was completed, which confirmed two hypoenhancing masses in the liver: segment VII (Figure 1) that was measured at 6 cm and segment IV at 2.6 cm (Figure 2). Additionally, multiple subcentimeter hypervascular foci were noted in segment II, V, VII, and VIII, including a 1.9 cm hypervascular lesion in segment V. The chest and pelvis were unremarkable.

DIFFERENTIAL DIAGNOSIS

WHAT IS THE CORRECT DIAGNOSIS?

A Hepatocellular adenoma

B Focal nodular hyperplasia

C Hepatocellular carcinoma

SEE BACK FOR ANSWER

WHAT IS THE CORRECT DIAGNOSIS FOR MS. BP?

A Hepatocellular adenoma (correct answer)

B Focal nodular hyperplasia

C Hepatocellular carcinoma

A **Hepatocellular Adenoma.** Hepatocellular adenomas (HCA) are benign liver lesions that occur from the proliferation of otherwise normal liver tissue and are strongly influenced by hormonal factors (Curry & Afdhal, 2019). These lesions primarily develop in females of childbearing age and are often related to birth control use. According to Marrero, Ahn, and Reddy (2014), there is a direct relationship between HCA and women who use oral contraceptive pills, with an incidence of 1 to 1.13 per million in nonusers to 34 per 1 million in users.

Ms. BP presented with several risk factors for the development of an HCA, which included a longstanding history of birth control pill use, PCOS, and obesity. Polycystic ovarian syndrome, which is characterized by metabolic dysfunction, includes type 2 diabetes, sleep apnea, psychological problems, central obesity, hypertension, insulin resistance, and dyslipidemia (Chandrasekaran & Sagili, 2018). Obesity and metabolic syndrome are seen in patients with HCA and are thought to be associated with malignant progression (Marrero et al., 2014). Obesity is considered by some to be the new risk factor for the development of HCA (Oji et al., 2019). According to Bioulac-Sage and colleagues (2013), females represent the majority of overweight/obese patients with HCAs. Interestingly, the frequency of HCA has increased over the past decade, which is thought to be related to the increasing rate of obesity (Bioulac-Sage et al., 2013).

Additionally, it is important to understand that patients with HCA are at an increased risk for developing hepatocellular carcinoma (HCC) and/or hemorrhaging. The risk for hemorrhaging occurs in patients with large adenomas greater than 5 cm in size and occurs in 11% to 29%. The risk for malignant transformation is related to the presence of β-catenin subtype, which can be identified on immunohistochemistry tissue staining (Marrero et al., 2014).

B **Focal Nodular Hyperplasia.** Focal nodular hyperplasia is a benign liver lesion that is generally associated with women in their 40s and 50s (Marrero et al., 2014). It is thought to occur as a result of a vascular abnormality. Definitive diagnosis of FNH is obtained by imaging in the majority of cases, particularly in those exhibiting a central scar at contrast CT and MRI and has a wheel spoke appearance with vessels radiating from the center of the tumor (Roncalli, Sciarra, & Tommaso, 2016). Focal nodular hyperplasia is not associated with malignant degeneration or risk of hemorrhage, and conservative management without intervention is generally recommended.

C **Hepatocellular Carcinoma.** Hepatocellular carcinoma is the second leading cause of cancer-related death worldwide (Marrero et al., 2014). It is often seen in the setting of cirrhosis. Risk factors for the development of HCC include viral and nonviral causes of cirrhosis (hepatitis B or C, nonalcoholic steatohepatitis, and alcohol), inherited errors of metabolism (hereditary hemochromatosis, porphyria cutanea tarda, α-1 antitrypsin deficiency, and Wilson disease), environmental exposures (aflatoxin), and primary biliary cirrhosis (Eatrides, Wang, Kothari, & Kim, 2017). Symptoms of HCC may include right upper quadrant pain, palpable liver mass, nodular liver, weight loss, hepatic bruits, pruritus, jaundice, splenomegaly, early satiety, fever, peripheral edema, and ascites (Sun & Sarna, 2008). In some cases, HCC can have a heterogeneous radiographic appearance that may mimic benign liver lesions, such as HCA or FNH. It is essential to obtain high-quality cross-sectional imaging to accurately diagnosis HCC and distinguish it from other focal liver lesions.

FOLLOW-UP

Pathology from the CT-guided biopsy confirmed the diagnosis of low-grade hepatocellular lesion,

favoring hepatic adenoma. Ms. BP was scheduled for follow-up per consensus guidelines (Figure 3). As stated by Chun and colleagues (2013), "Guidelines for surgical management of HCAs include resection of all adenomas in men, regardless of lesion size, given their risk of malignant transformation, resection of adenomas associated with symptoms or hemorrhage, observation off oral contraceptives for adenomas ≤ 5 cm in women, and resection of adenomas > 5 cm in women." Liver lesions can be frightening for patients and caregivers, but by understanding their characteristics, including presentation, implications, and potential causes, care can be focused on necessary earlier interventions to improve outcomes.

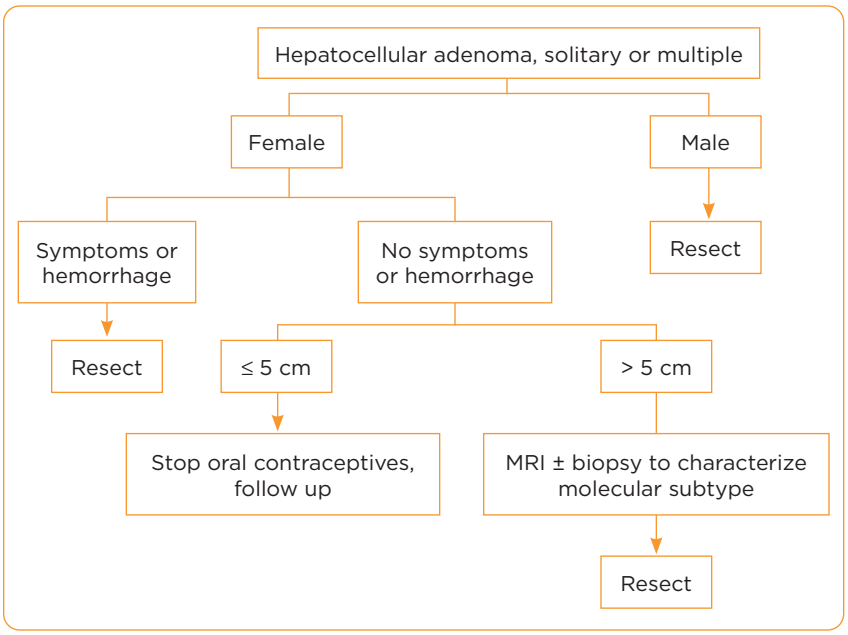

Figure 3. Consensus guidelines.

Disclosure

The authors have no conflicts of interest to disclose.

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