

Hypervascular hepatic mass in a patient with breast cancer

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QUESTION

A 51-year-old woman was admitted to Chinese Academy of Medical Sciences Cancer Hospital with a diagnosis of a hepatic mass from an enhanced CT for breast cancer follow-up. The patient underwent modified radical mastectomy for cancer in the right breast in our hospital 1.5 years ago. Before the surgery, the enhanced chest CT had shown a hypodense lesion in the liver, but at that time, the radiologist did not report the lesion (Figure 1). The post-operative pathology of breast cancer was T2N1a in the Tumor-Node-Metastasis (TNM) stage; Three out of sixty axillary lymph nodes were positive for metastasis. The patient received 8 cycles of AC sequential T chemotherapy (pirarubicin; cyclophosphamide sequential docetaxel), 25 cycles of radiotherapy, and preventive ovariectomy. Since January 2018, the patient has taken exemestane and appeared for regular review.

Six months ago, a hepatic lesion was detected in enhanced CT and described in a further liver MRI as a nodular abnormal signal under the right capsule of the liver,

whose size was about 1.7 cm × 1.6 cm; a high signal in T1WI and a slightly high signal in T2WI/FS and DWI. Obvious enhancement of the arterial phase and contrast

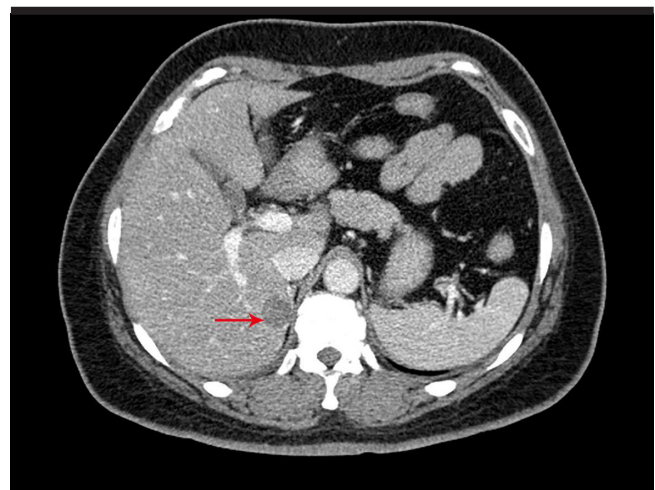


Figure 1. Chest enhanced CT scanned a low-density mass at the VII segment (arrow).

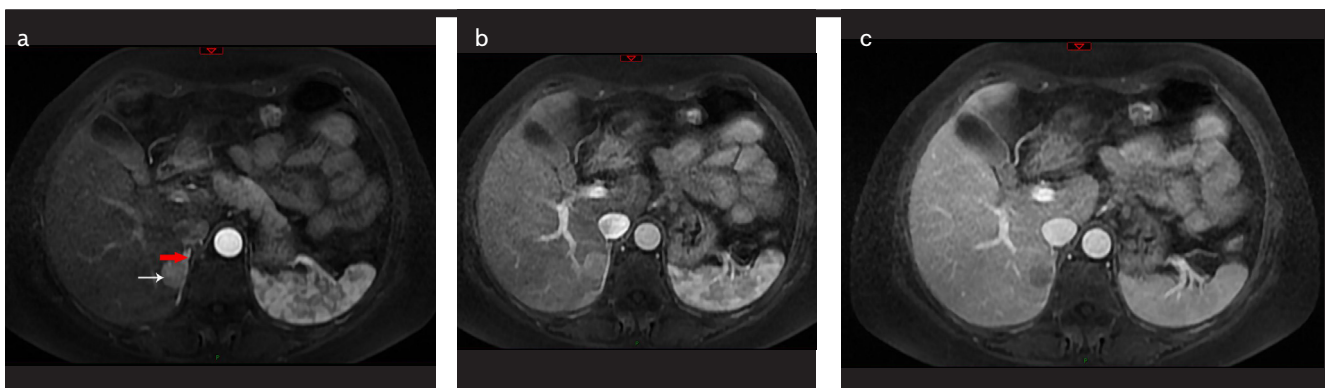


Figure 2. a-c. (a) Arterial phase magnetic resonance imaging shows enhancement of the mass (white arrow) and right adrenal gland (red arrow). (b) and (c): Contrast clearance can be seen in the portal vein phase and delayed phase. A normal right-side adrenal gland was visualized.

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clearance could be seen in the portal vein phase and delayed phase, and the right adrenal gland was normal (Figure 2). A PET-CT showed no increase in metabolism of the hypodense subcapsular shadow of the right lobe. The laboratory investigation showed no elevation of serum alpha-fetoprotein (AFP) or carcinoembryonic antigen (CEA). Hepatitis B surface antigens and hepatitis C antibodies were negative. Other laboratory data showed no evidence of organ disorder, including liver dysfunction.

She underwent subsegmentectomy of the VII segment in March 2019 and recovered well after surgery. In the operation, the hepatic mass was located under the capsule of the hepatic VII segment, and the right adrenal gland was easily separated from the liver and showed no abnormality. Macroscopically, the tumor was a well-circumscribed, yellowish nodular lesion (Figure 3).

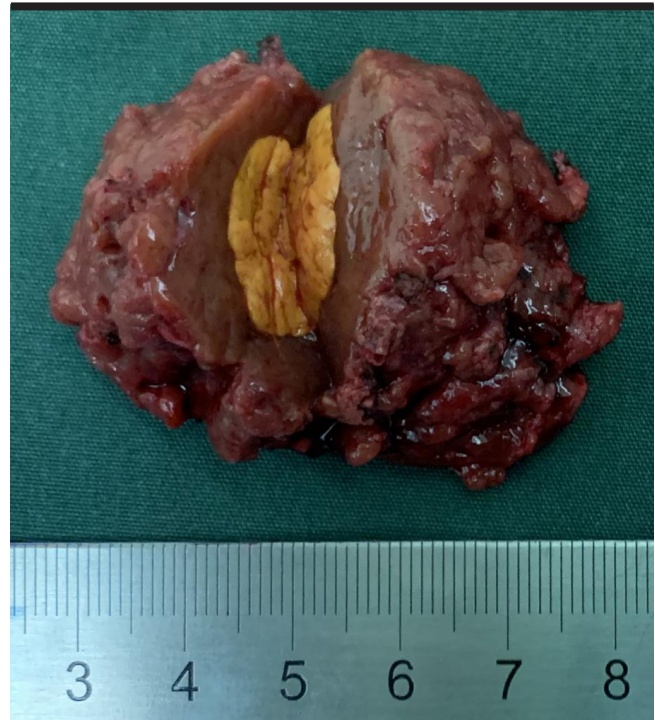


Figure 3. A macroscopic appearance of the tumor: a well-circumscribed, yellowish, nodular lesion was observed beneath the capsule of the steatosis liver.

ANSWER

The liver lesion was diagnosed as an ectopic adrenal gland.

Microscopic findings showed the characteristic features of cortical and medulla adrenal tissue (Figure 4). The immunohistochemical results of pathological sections showed that CK19 (-), CK7 (-), Hepatocyte (-), Ki-67 (3%), PR (1+), ER (-), Inhibin (2+), Melan-A (3+), Syno (2+), ChrA (-) (Figure 5). There was no evidence of mitotic activity.

DISCUSSION

The heterotopia adrenal tissue is derived from adrenal primordium that has migrated at an embryonic stage from neighboring organs such as the kidney or liver (1). It is more common in childhood in the midline position, of which a size greater than 1 cm is rare. Presence of the ectopic adrenal gland in the liver of adults is rarely reported; however, there are a few studies on finding an adrenal rest tumor in the liver, abbreviated as HART (hepatic adrenal rest tumor). Differences between the ectopic adrenal gland and HART are indefinite. One study indicated that the ectopic adrenal tissue is also known as the adrenal rest tissue (2). Others indicated that the ectopic adrenal tissue consists of both cortex and medulla cells, but the adrenal rest tissue only consists of adrenocortical cells (3).

Preoperative radiologic differentiation of the HART from other primary hepatic tumors is difficult. Previous case reports have suggested that the HART is nourished mainly by the hepatic arteries. At imaging, the HART is typically a subcapsular tumor, demonstrating macroscopic fat and hypervascularity (4).

The wide spectrum of diagnostic possibilities for a hypervascular liver tumor includes hepatocellular carcinoma, hemangiomas, focal nodular hyperplasia, hepatic adenomas, and some metastatic tumor. Patients with hepatitis or cirrhosis have high risk for hepatocellular carcinoma, and patients who have a history of malignant extrahepatic disease are more likely to have a metastatic tumor. As for breast cancer, routine evaluation of abdominal organs was not recommended for patients with asymptomatic early stage (I/II) breast cancer preoperatively according to the NCCN guideline. However, it was recommended for follow-up every 3 months for 1 to 2 years and every 4 to 6 months for 3 to 4 years after surgery, including physical examination, liver ultrasound, and blood test.

However, a study showed that an age above 45 years, elevated alanine aminotransferase (ALT), and a number of nodules more than 3 cm are also significant risk factors for hypervascular liver lesion malignancy (5).

On pathological diagnosis, it is not difficult to distinguish the ectopic adrenal tissue or adrenal raised tumor from hepatocellular carcinoma based on the histology images in microscopic hematoxylin-eosin staining. Immunohistochemistry staining has always been used to confirm the diagnosis. Recently, it has become immunohistochemically possible to detect protein antigens involved in adrenocortical steroidogenesis.

The indications for liver biopsy include a hepatic mass with suspicious malignancy with normal AFP and negative PET. If it is a benign lesion in biopsy, the treatment depends on its pathology and symptom. Malignant transformation can be found in a benign tumor such as liver cell adenoma; hence, there is a need for surgery to pre-

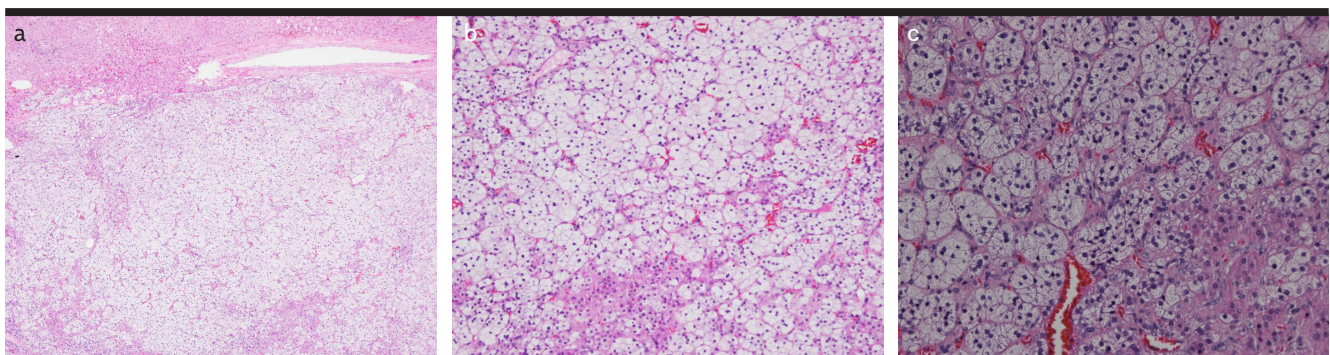


Figure 4. a-c. Hematoxylin-Eosin stain at 4 x 0.2 (a), 10x (b), and 20 x 4 (c) magnification. (a) The lesion was encapsulated by a thin fibrous capsule. (b) The lesion was composed of clear cells and eosinophilic cells. The former cells were the major components, with a bubbly cytoplasm and arranged in alveolar clusters. (c) The lesion with an abundant sinusoidal capillary.

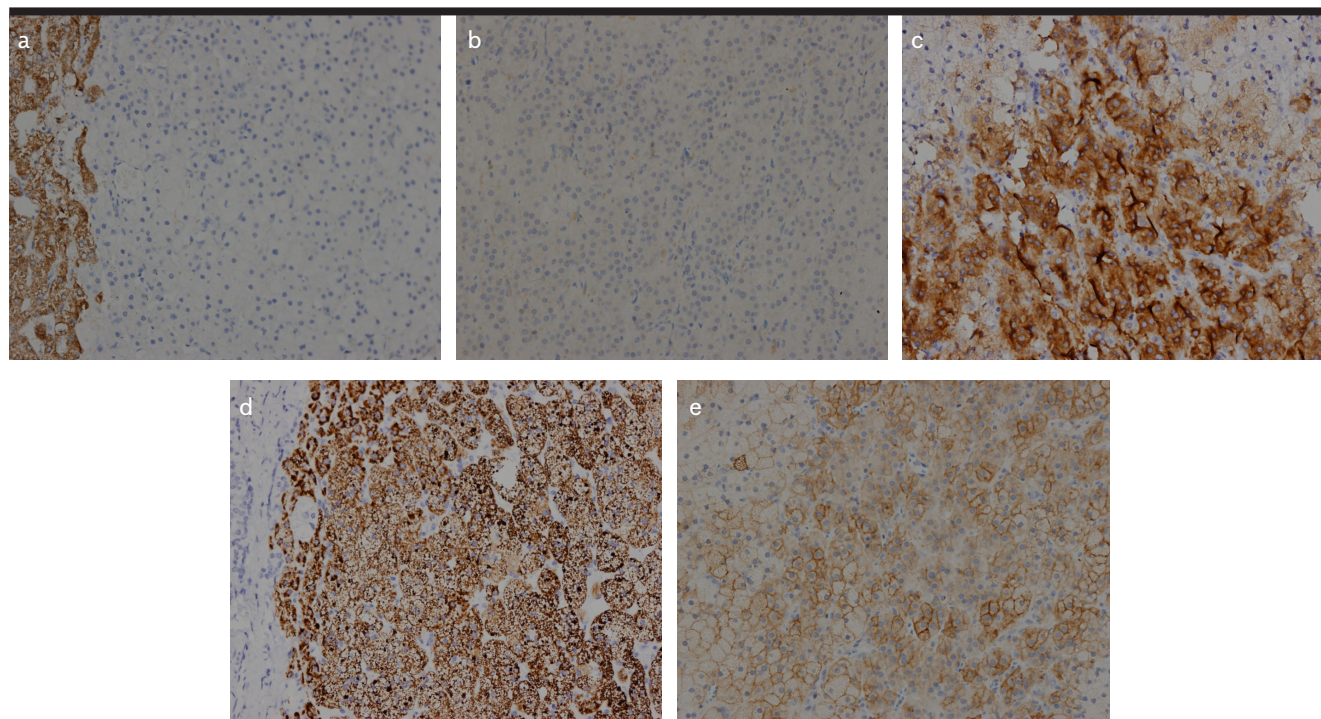


Figure 5. a-e. Immunohistochemistry findings. (a) and (b) The cytoplasm of tumor cells was negative for hepatocyte and ChrA. (c), (d), and (e) The cells are positive for Inhibin, Melan-A, and Syno (all photomicrographs 20×).

vent malignant transformation. If the mass is symptomatic, a surgery would also be under consideration.

However, in this case, the patient had a clear history of breast cancer, so liver metastasis of breast cancer was considered first at the outpatient clinic, which led to a surgery straightaway instead of an initial biopsy. On the other hand, if the preoperative diagnosis was limited to the ectopic adrenal gland, neither would the patient have symptoms nor could the ectopic adrenal gland transform into a malignant tumor; therefore, the surgery was unnecessary.

Informed Consent: Written informed consent was obtained from the patients who participated in this study.

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