

Case Report

Metastatic Renal Cell Carcinoma within a Hepatic Focal Nodular Hyperplasia: A Case Report and Review of the Literature

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Abstract: A patient with microscopic metastatic renal cell carcinoma within liver focal nodular hyperplasia (FNH) is reported here. The initial CT scan was classic for liver FNH yet the following liver resection showed a microscopic metastatic renal cell carcinoma (0.48 cm) within the liver nodule. FNH in a patient with existing primary tumor probably warrants further investigation as the coexistence of metastatic disease may significantly alter treatment. The high arterial blood flow in the liver FNH may predispose the region to develop a metastatic tumor. Also possible is that a metastatic tumor may cause a local vascular flow abnormality which induces hepatocellular hyperplasia, resulting in a secondary FNH.

Key Words: Focal nodular hyperplasia, metastatic renal cell carcinoma, computed tomographic (CT) scan

Introduction

Focal nodular hyperplasia (FNH) is a benign, non-neoplastic lesion that is most commonly seen in young women [1, 2]. Two third of the cases are associated with oral contraceptive use. However, a significant number of these cases may also be seen in men. FNH is usually solitary but can be multifocal in 20-30% of cases. FNH is often found incidentally and has been associated with hepatic hemangioma, vascular malformation, meningioma, and astrocytoma [3-5]. Although enhancement on the arterial phase of contrast occurs in almost all FNH, the classic stellate central scar is only present in 15% to 33% of cases [6]. In this report, we describe a patient with renal cell carcinoma metastasis within a liver FNH. A literature search reveals there has been only one case report of a rectal adenocarcinoma metastasis to a liver FNH [7]. To our knowledge, this is the second report of such findings.

Report of a Case

A 62-year-old white male with a history of chronic low back pain presented to the emergency department with severe right-sided chest pain and shortness of breath. A chest and abdominal CT scan showed pneumothorax and a 5.0 x 4.0 cm mass in the left hepatic lobe which enhanced with contrast (**Figure 1**) and had a low attenuation central area, consistent with a central stellate scar, typical of FNH. In the right kidney, there was a 6.7 x 4.0 cm right lower pole enhancing lesion with internal calcification, highly suspicious for renal cell cancer. Therefore, in the setting of a possible renal cell carcinoma, the differential diagnosis for the liver mass was metastatic renal cell carcinoma versus other non-malignant liver lesions, such as FNH. A CT-guided core biopsy of the liver lesion demonstrated limited tissue with predominantly benign liver parenchyma and no pathological diagnosis. Laparoscopic resection of the liver mass and a right radical nephrectomy were therefore performed. The patient recovered well and was discharged home four days post-operation. Past social history of the patient includes 40 pack/year

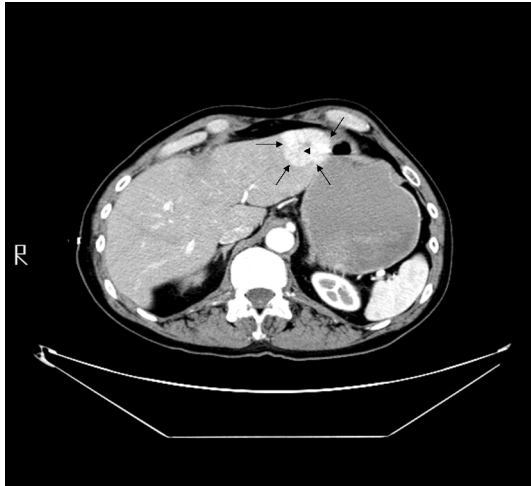


Figure 1 A CT scan of the abdomen demonstrated a mass (arrows) in the left hepatic lobe, 5.0 x 4.0 cm, which enhanced with contrast. A central scar (arrowhead) was illustrated as the area of low attenuation.

cigarette smoking, alcohol consumption of 2 gm/day over 40 years.

Pathologic Findings

Liver left lobe segmental resection grossly revealed a 5.0 x 4.0 cm multi-nodular lesion composed of well circumscribed nodules varying in size (0.5 to 2.0 cm) with a dense white, firm central stellate scar. Microscopic examination revealed a 0.48 cm (in greatest dimension) metastatic renal cell carcinoma within the liver FNH (**Figure 2**). Pathological analysis of the resected right kidney displayed a clear cell type renal cell carcinoma without vascular or lymphatic invasions.

Discussion

After hemangioma, FNH is the second most common benign tumor of the liver. Although

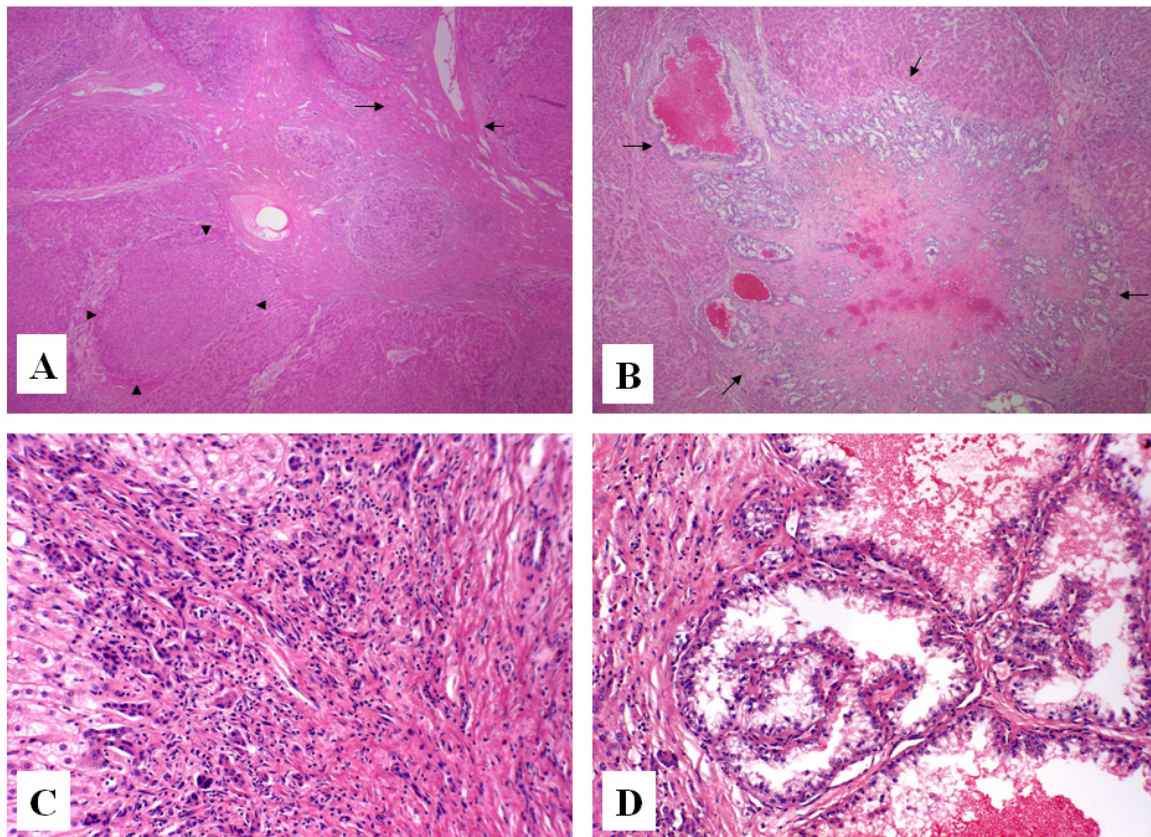


Figure 2 Histopathological features of renal cell carcinoma metastasis to hepatic focal nodular hyperplasia. **A.** Central scar (arrows) with normal-appearing hepatocytes arranged in nodules (arrowheads) and separated by thin fibrous bands. **B.** Renal cell carcinoma metastasis in focal nodular hyperplasia. High power view of focal nodular hyperplasia showing fibrosis, proliferating bile ductules at the edge of hepatocyte nodules and the absence of portal vessels (**C**) as well as the metastatic renal cell carcinoma of clear cell type (**D**).

the pathophysiology is not completely understood, it is believed that a congenital arteriovenous malformation results in increased blood flow which, in turn, triggers hepatocellular hyperplasia [8]. A nuclear medicine Tc-99m sulfur colloid scan with SPECT is a useful diagnostic tool because frequently (50-70%) the Kupffer cells show normal or increased uptake, almost pathognomonic for FNH [6, 9]. Other more aggressive hepatic lesions, especially poorly differentiated hepatocellular cancer and metastases, will show cold spots on Tc-99m sulfur colloid scan [6, 9].

The co-existence of FNH and metastatic renal cell carcinoma makes us speculate that the high blood flow to the lesion, thought to be critical for the secondary hepatocellular hyperplasia, predisposes the region to develop a metastatic neoplasm from the systemic, nonportal circulation [8]. Also possible is that a metastatic tumor may cause a local vascular flow abnormality, which induces hepatocellular hyperplasia, resulting in a secondary FNH. This may account for the association of FNH with primary and metastatic hepatic tumors [10].

Making the distinction between a benign hepatic mass and renal cell carcinoma metastatic to the liver is crucial for the staging, prognosis and treatment of a patient with renal cell carcinoma. On CT scan, focal nodular hyperplasia appears as a well-demarcated hypodense or isodense mass that typically undergoes uniform hyperdense enhancement following contrast injection [6]. Metastatic renal cell carcinoma on CT scan appears as foci of intense enhancement relative to the adjacent hepatic parenchyma. It may be difficult to distinguish between benign hepatic masses and metastatic renal cell carcinoma on conventional CT or sonography [4].

In 1989, Wishnow et al reported two cases of benign liver lesions that were incorrectly diagnosed initially as metastatic renal cell carcinoma [4]. One of them eventually was diagnosed FNH after intra-operative liver biopsy [4]. In 1998, Ohishi et al used 3-D sonography to visualize different patterns of blood flow inside livers and Gualdi et al reported applying triphasic spiral CT to show different liver enhancement patterns. Both claimed that they could differentiate FNH from malignant liver diseases based on the different blood flow or enhancement patterns.

In 1993, Mahfouz et al demonstrated significant homogenous early enhancement in FNH lesions compared with metastatic liver tumors [11]. However, it becomes more complicated when applying these rules of analysis using 3-D sonography or spiral CT in the setting of a mixed lesion, such as renal cell metastasis within FNH.

Therefore, in a patient with primary tumor and liver FNH, close follow-up or further investigation including biopsy may be warranted to exclude microscopic tumor metastasis.

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