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Case report

Hybrid Single Photon Emission Computed Tomography/Computed Tomography Sulphur Colloid Scintigraphy in Focal Nodular Hyperplasia

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Abstract

It is important to differentiate focal nodular hyperplasia (FNH), a benign condition of liver most commonly affecting women, from other neoplasm such as hepatic adenoma and metastasis. The functional reticuloendothelial features of FNH can be demonstrated by scintigraphy. We present a case of breast cancer in whom fluorodeoxyglucose positron emission tomography/computerized tomography (CT) showed a homogenous hyperdense lesion in liver, which on Tc99m sulfur colloid single-photon emission computed tomography/CT was found to have increased focal tracer uptake suggestive of FNH.

Keywords: Focal nodular hyperplasia, hybrid single-photon emission computed tomography/computerized tomography, sulfur colloid

Introduction

Focal nodular hyperplasia (FNH), most frequently detected as incidental finding, is a benign condition of liver[1] and is most commonly seen in women in their third and fourth decade of life.[1,2] Majority of patients with FNH (90%) are asymptomatic.[3] The most space occupying lesions seen on ultrasonography (USG) and computed tomography (CT) will have decreased sulfur colloid uptake whether they are benign or malignant, except for FNH, which may be cold or warm depending on the amount of Kupffer cells presence. FNH is a benign tumor with no malignant potential and does not usually require surgical excision. In cases where the imaging findings are strongly supportive of a FNH, biopsy may not be necessary. If follow-up studies are considered necessary to ensure the stability of the lesion, 3-month, 6-month, 1-year, and 2-year follow-up examination are reasonable.[2]

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Case Report

A 45-year-old female presented with diffused abdominal pain in right hypochondrium for the past 3-month. The pain was not associated with any nausea, vomiting or relation with food intake and there was no history of any fever, weight loss or loss of appetite. Patient was not on any oral contraceptive but had history of breast carcinoma (left) treated 3 years back. Aspartate aminotransferase and alanine aminotransferase were within the normal limits. USG showed normal sized liver with homogeneous well defined hypoechoic area in right lobe. Fluorodeoxyglucose (FDG) positron emission tomography/CT done as a part of the breast cancer follow-up showed homogenous hyperdense lesion with physiological FDG uptake in segment IVb of the liver [Figure 1a and b]. Tc99m sulfur colloid single-photon emission computed tomography/CT done for the evaluation of this focal lesion showed increased focal tracer uptake in the liver localized to segment IV of the liver [Figure 1c]. The follow-up sulfur colloid liver scan performed after about 4 months did not show any significant change in findings [Figure 1d].

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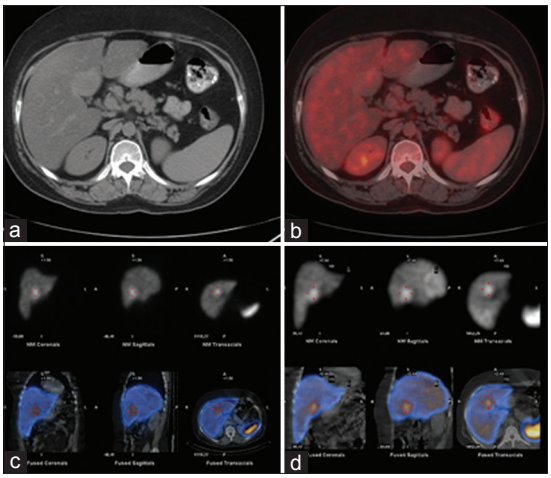

Figure 1: F-18 fluorodeoxyglucose (FDG) positron emission tomography/computerised tomography (PET/CT) images (a) transaxial CT image (b) transaxial PET/CT image in a patient of breast cancer showing homogenous hyperdense lesion with physiological FDG uptake in segment IVb of the liver. Tc99m sulfur colloid single-photon emission computed tomography/CT images (c) initial and (d) follow-up show increased focal tracer uptake in the liver lesion noticed on PET/CT with no significant change on follow-up, suggestive of preserved Kupffer cells function mostly seen in focal nodular hyperplasia

Discussion

The etiology of FNH lesions remains unknown, but may be due to hyperplastic response of normal hepatocytes to a preexisting vascular malformation.[4] It is reported that neither the size nor the number of FNH lesions are influenced by oral contraceptive use,[5] but these may promote the growth of FNH.[6,7] The importance of FNH relates to its differentiation from other neoplasm such as hepatic adenoma and metastasis.[3] However, the differentiation of FNH from other primary and secondary hepatic lesion is sometimes not possible. Abdominal USG reveals 80% of the masses are hypoechoic or isoechoic to the normal hepatic parenchyma. On unenhanced CT scans FNH usually appears as a homogeneous, slightly hypo attenuation or iso attenuating mass.[2] A central hypo attenuation scar may be visualized in approximately one–third of the cases; in some cases, the scar may be extremely small and subtle.[8] These may appear isodense or hyperdense following contrast administration.[3]

The functional reticuloendothelial and hepatocellular features of FNH can be demonstrated by scintigraphy.[9] Labeled sulfur colloid particles identify Kupffer cells of the liver; most space occupying lesions show decreased sulfur colloid uptake whether they are benign or malignant, except for FNH which depending on number of Kupffer cells may appear cold, iso-intense, or warm.[10] Normal or increased uptake on Tc99m sulfur colloid scan is extremely helpful in supporting the diagnosis of FNH. In cases where the diagnosis of FNH is uncertain because of the lack of characteristic imaging findings biopsy are diagnostic in most cases. In cases where the imaging findings are strongly supportive of a FNH, biopsy may not be necessary. Follow-up studies whether required or not is debatable. It is believed that follow-up studies are not necessary when appearance is classic for FNH.

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