

Focal fatty liver sparing lesion presenting as a “pseudotumour” : case report

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Abstract

We are reporting our experience of a case of “focal fatty liver sparing lesion” in a 24-year-old patient, without any evident predisposing factors for fatty infiltration of the liver. Fatty liver infiltration was sparing the posterior part of liver segment VI, defining an area which was mimicking a lesion on US and CT. Fatty liver infiltration is usually diffuse but may be patchy or localized. Occasionally, focal areas of normal parenchyma in an otherwise diffuse fatty liver may simulate mass lesions. Typically, these “pseudolesions” appear as echo-poor areas against a background of bright echoes due to fatty infiltration and may pose a difficult diagnostic problem. We present this case and discuss the investigation process in order to differentiate this lesion from a hepatic tumor. (*Acta gastroenterol. belg.*, 2006, 69, 323-326).

Key words : focal fatty liver sparing lesion, nonalcoholic fatty liver disease, steatosis.

Introduction

Nonalcoholic fatty liver disease (NAFLD) is a disorder with histologic features of alcohol-induced liver disease (steatosis) which occurs in people who do not consume significant amounts of alcohol (none or ≤ 20 g per day) (1). Obesity, diabetes mellitus, hyperlipidemia, and metabolic syndrome are thought to be the more common predisposing conditions (1-6). Other identified risk factors include total parenteral nutrition, protein-calorie malnutrition, jejunioleal bypass for quick weight reduction, and the use of certain drugs (4,7,8). Nevertheless, many affected patients lack typical risk factors (1,9). US, CT and magnetic resonance imaging can identify hepatic steatosis and may correlate with the histopathological grade of liver disease (10).

In contrast to NAFLD, which is a diffuse parenchymal process, “focal fatty liver”, firstly described by Brawer and colleagues in 1980 (11), is a localized or patchy process which simulates a space – occupying lesion of the liver. Thus, it may be confused with other focal lesions such as abscesses, metastases and infiltrative primary liver neoplasm. Occasionally, focal areas of decreased fatty infiltration are seen in an otherwise diffuse fatty liver. These areas are called “focal sparing”, “skipped areas”, or “pseudotumors”. Focal sparing is defined as an area of liver parenchyma of relatively low echogenicity with lack of mass effect (1,12,13).

We present a case of “focal sparing lesion” in a 24-year-old patient, with absence of any associated risk fac-

tor for fatty infiltration of the liver. Fatty liver infiltration was sparing the posterior part of liver segment VI, mimicking a space-occupying lesion on abdominal ultrasound (US) and computed tomography (CT). A thorough investigational process revealed that the corresponding lesion was the remaining normal liver parenchyma in an otherwise diffusely infiltrated by fat liver. We report this case and discuss the investigations we carried out in order to differentiate this lesion from a hepatic tumor.

Case report

A 24-year-old man was admitted to our hospital with an asthma attack. During routine laboratory tests, mildly increased aminotransferase levels (ALT) and gamma-glutamyl transpeptidase (γ -GT) levels were noted : ALT 75 IU/dl (normal range, 5-40 IU/dL) and γ -GT 54 IU/dL (normal range, 9-40 IU/dL). The patient was referred to our Department for further evaluation. The patient's history and physical examination was negative for hepatomegaly, splenomegaly, abdominal pain or stigmata of chronic liver disease. Serology tests for HBsAg, anti-HBc, anti-HCV, anti-HAV, anti-HIV and anti-CMV were negative. An abdominal ultrasonographic study was performed, which revealed a spherical relatively hypoechoic mass-like lesion, measuring 5.5 cm in the longest diameter at the posterior area of the right hepatic lobe (segment VI) (Fig. 1).

The lesion had a sub-segmental distribution without any significant mass effect on the adjacent hepatic and portal veins, but it could not be differentiated from a hepatic tumor, such as hepatocellular carcinoma, metastasis, cavernous haemangioma, adenoma or focal nodular hyperplasia (FNH).

Due to the lack of predisposing factors for fatty liver infiltration (obesity [Body Mass Index : 23.1], no alcohol intake or medications, absence of an underlying liver

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Fig. 1. — Axial US scan of the liver shows a hypoechoic, well-circumscribed oval mass (white arrow) at the posterior edge of the right liver lobe.

disease, hyperglycemia, hyperlipidemia, diabetes mellitus, or metabolic syndrome), the suspicion of a focal sparing lesion in diffuse fatty liver was not initially prompted and a further laboratory and imaging investigation was undertaken. Through the course of the investigation liver biochemistry tests returned to normal and the tumor markers (a-Fetoprotein, CEA and CA 19-9) were within normal limits.

The ultrasound characteristics of the lesion were consistent with a space occupying process, raising suspicion of a mitotic lesion. In order to rule out neoplasm/haemangioma a spiral CT study was carried out. The unenhanced scan revealed the corresponding area to be of increased attenuation (Fig. 2a). After intravenous contrast infusion, the lesion was presented with a higher attenuation than the surrounding parenchyma. No vascular invasion, extra-hepatic spread or regional lymph node involvement was noted (Fig. 2b).

The CT study was not suggestive of haemangioma. However, hepatic adenoma (HA), Focal Nodular Hyperplasia (FNH) and malignancy remained as differential diagnostic possibilities. A magnetic resonance imaging (MRI) study was performed, that failed to discriminate the features of the lesion (Figs. 3a and 3b).

The imaging modalities used proved to be insensitive and nonspecific to characterize the lesion. Therefore, the necessity of a targeted liver biopsy for establishing a diagnosis was evident. A CT-guided core needle biopsy was performed. Histologic examination revealed that the tissue sample contained normal hepatic parenchyma at the front fragment and high fat deposition at the rear (Figs. 4a, 4b and 4c). The “hepatic mass lesion”, which we vigorously investigated, proved to be an area of normal liver, while the rest hepatic parenchyma was affected by fatty infiltration and therefore the diagnosis of a “fatty liver sparing lesion” was established.

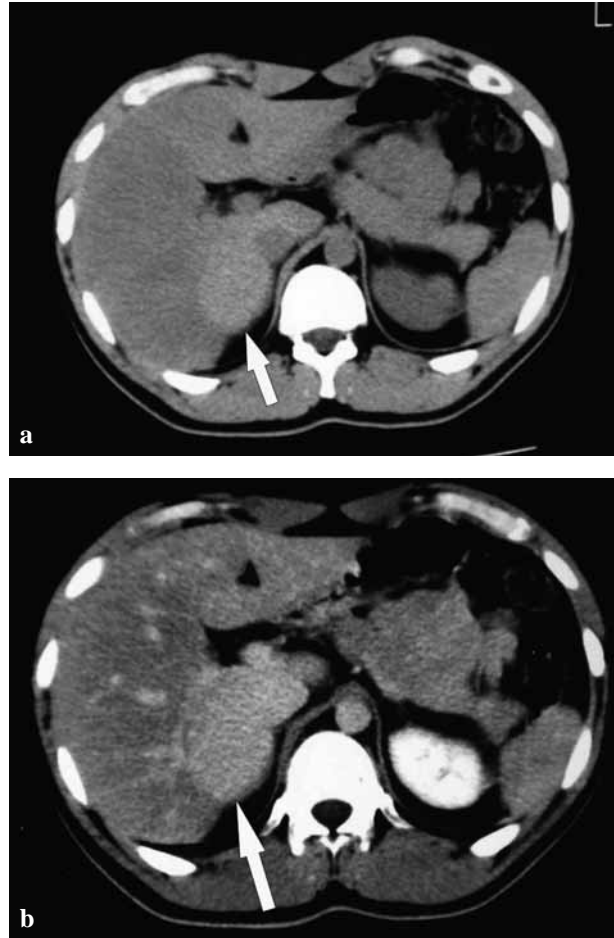


Fig. 2. — (a) Unenhanced abdominal CT scan shows a hyperdense liver mass (white arrow) at the posterior part of liver segment VI compared to the low-density surrounding liver parenchyma, (b) Post-contrast CT scan at the same level shows homogeneous enhancement of the liver mass (white arrow) compared to lesser enhancement of the surrounding liver parenchyma.

During follow-up, six months later, the patient remained asymptomatic, the imaging studies (US and CT) were unchanged and no predisposing factors for liver disease (including fatty liver) were identified.

Discussion

In our case, a “mass” consisting of normal parenchyma in a liver diffusely infiltrated by fat, was found in a young patient without any predisposing factor for fatty liver infiltration. We performed a series of investigation including imaging studies and a guided liver biopsy in order to clarify the nature of the “lesion”. We believe that the presentation of this case can be useful to the physician from two perspectives. Firstly, it outlines the possibility of “normal liver” to be mistaken for a mass in a liver diffusely infiltrated by fat. Secondly, it shows that sometimes the lack of predisposing risk factors should

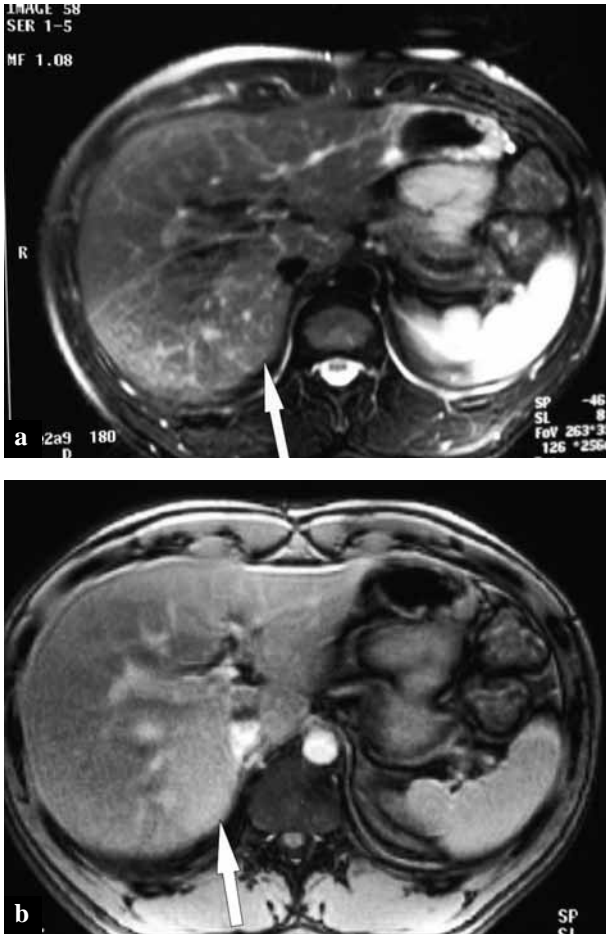


Fig. 3. — (a) On axial fat suppressed T2-weighted MR image the lesion (white arrow) shows a slight more intense signal than the surrounding liver parenchyma, (b) Axial contrast enhanced T1-weighted MR image shows homogenous enhancement of the lesion (white arrow) compared to the surrounding parenchyma.

not rule out the diagnosis of NAFLD. Taking into consideration the logarithmic rise in the number of patients with fatty infiltration of the liver in Western world societies (2,3) we believe that such images, as the ones we currently present, will become more common posing differential diagnostic dilemmas to the physicians of the future in everyday practice.

The “lesion” in our case was located in the posterior segment VI of the right hepatic lobe. The most common sites of focal sparing are the pericholecystic region and the posterior edge of segment IV. There is no evidence that the pathogenesis of both focal fatty infiltration and focal fatty sparing is similar to that of NAFLD. The precise pathophysiological process is still unknown. However, it has been recognized that there is a close correlation between some areas of focal fatty liver sparing and regional variation in the intra-hepatic portal circulation (12,13). On top of that, there have been reports of the occurrence of focal fatty infiltration or focal sparing lesions in areas of aberrant gastric venous drainage (14-

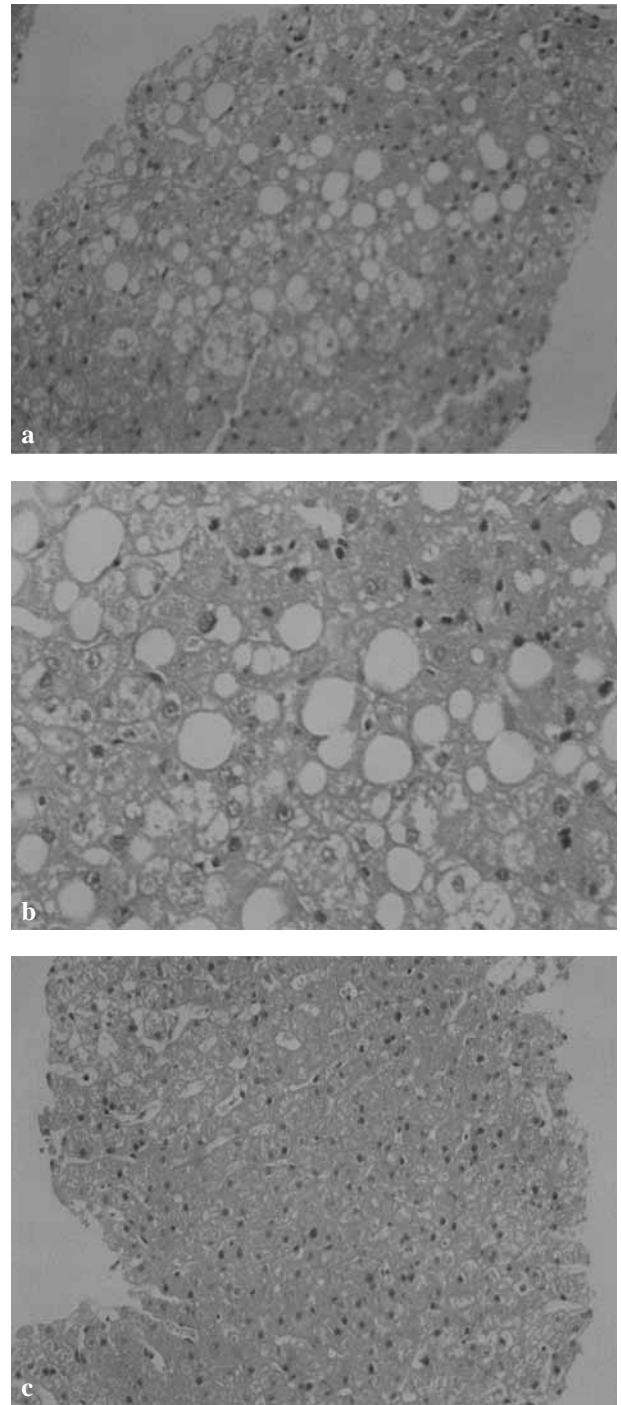


Fig. 4. — Liver biopsy : (a) focal fatty transformation of hepatocytes with nodular configuration, magnification $\times 200$, (b) hepatic steatosis, mainly macrovesicular, magnification $\times 400$, and (c) normal hepatocytes adjacent to the “lesion”, magnification $\times 400$.

17), but it is unclear why the same variation of blood supply in the posterior edge of the medial segment of the liver causes focal fatty infiltration in some cases and focal spared areas in others. It is suspected that a decrease in the portal blood flow may cause microcirculatory disturbance inducing some kind of metabolic

changes in the hepatocytes (12). However, the exact reason for the occurrence of focal sparing in diffuse fatty liver remains unclear. In particular, focal sparing at the posterior edge of segment IV has been shown to be related to aberrant gastric venous drainage (14,15) while focal sparing of segment II may be related to non-portal venous inflow variations (17,18).

Cases with segmental sparing of fatty infiltration in NAFLD can cause diagnostic confusion (13), since these areas resemble benign or malignant focal liver lesions (19,20). Physicians and radiologists confronted with hepatic masses should be aware of the "fatty liver sparing lesion", a benign entity which occasionally may be troublesome to diagnosis.

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