Phantom steatosis of the liver : Report of a case

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Abstract : A patient, referred under a diagnosis of metastatic liver tumors, was found to have multiple areas of focal fatty change (FFC) which, during follow-up, exhibited discordant evolutions. To our knowledge, this phenomenon-regression of a FFC lesion with concurrent appearance or progression of other similar lesions in the same patient, has been reported in only one previous case. FFC can be strongly suggested by clinical, biochemical and radiologic criteria. However, an exact diagnosis can only be made with biopsy. To avoid misdiagnosing a malignancy as FFC and vice versa, biopsy should be performed without hesitation in all patients in whom a change in approach is possible.

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INTRODUCTION

With the widespread availability of imaging techniques, focal fatty change of the liver (FFC) has become a well-recognized radiological entity (1-5). However, this entity may cause significant difficulties in the differential diagnosis of a focal hepatic lesion i.e. misdiagnosis of an FFC area as malignancy and vice versa (1-8). In this paper, we report a case of focal fatty change in the liver, which was suspected of being malignant.

CASE REPORT

A 53-year-old woman with poorly controlled diabetes mellitus, was referred from another institution due to ultrasonographic findings of multiple hyperechogenic masses in the liver. The patient complained of right upper abdominal pain of one year's duration. Physical examination revealed obesity, tender hepatomegaly and pain in the right upper abdominal quadrant upon deep palpation. Her blood urea, creatinine, aspartate aminotranferase, alanine aminotransferase, alkaline phosphatase, gamma-glutamyl transpeptidase and alpha-fetoprotein levels were normal. Serology for hepatitis B and C viruses were negative. The patient had no history of alcohol consumption. Complete blood count and electrophoresis of serum proteins were normal. The available computerized tomography (CT) images (November 1995) revealed well circumscribed hypodense lesions in the left lobe (21 mm), the caudate lobe (50 mm) and the right lobe (17mm) (Figure 1a-1b). All lesions were similar in appearance. The average attenuation value of -37 Hounsfield units (HU) was compatible with the fatty nature of these lesions. A control magnetic resonance imaging (MRI) study was performed (February 1996). The lesions in the left and right lobes were no longer visible ; the large lesion in the caudate lobe had regressed considerably and there was a new lesion on the anterior surface of the left lobe (Figure 2). The fatty nature of these lesions was confirmed by fat-saturation sequences (Figure 3). Thru-cut biopsy of the caudate lobe lesion was performed under CT-guidance (Picture 1). Biopsy revealed septal fibrosis with moderate macro- and microvesicular steatosis. The patient had poorly controlled diabetes mellitus. Her diabetes was regulated with insulin and diet and she was discharged with the diagnosis of FFC. On follow-up examination ten months later, she had no obvious complaints. Computerized tomography was performed (December

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1996). The lesion in the caudate lobe had disappeared while the lesion in the left lobe had increased in size ; there was a new lesion in the right lobe (Figure 4). FNB from the left lobe lesion again revealed steatosis.

On MRI examination performed in January 1997, all lesions had regressed. On MRI scan in May 1997, all lesions had disappeared (Figure 5).

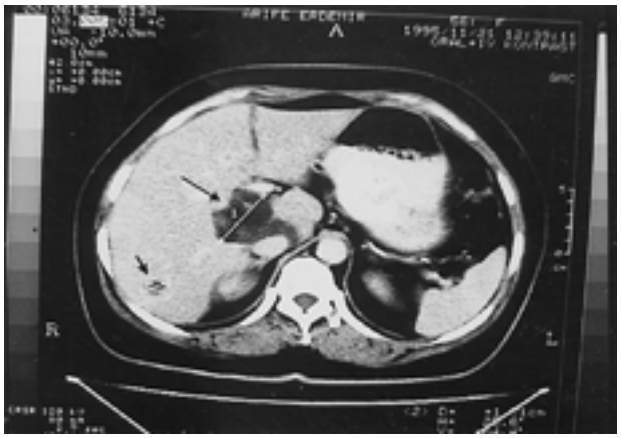


Fig.1 a. The initial CT of the patient (November 1995) with IV contrast, showing lesions in the right and caudate lobes of the liver.

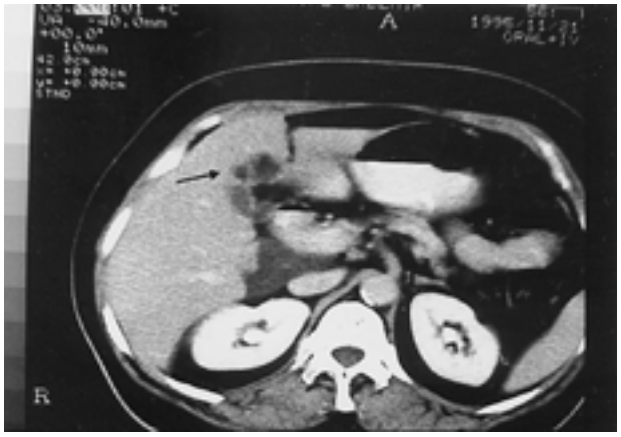


Fig.1 b. Arrow indicates the lesion in the left lobe of the liver.

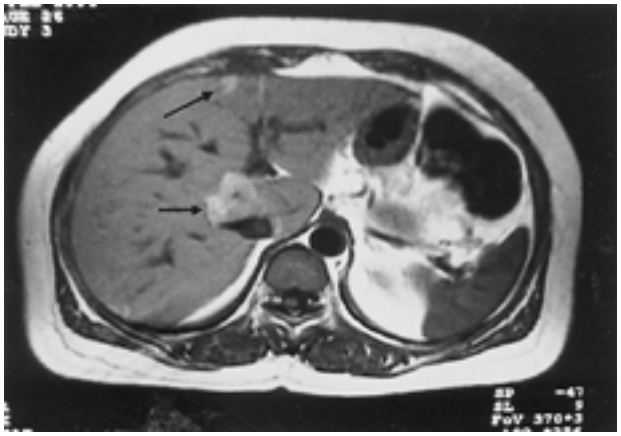


Fig. 2. MRI scan of the patient (February 1996) : There was a new lesion in the left lobe (top arrow). The caudate lobe lesion had decreased in size (bottom arrow) ; the other lesions had disappeared.

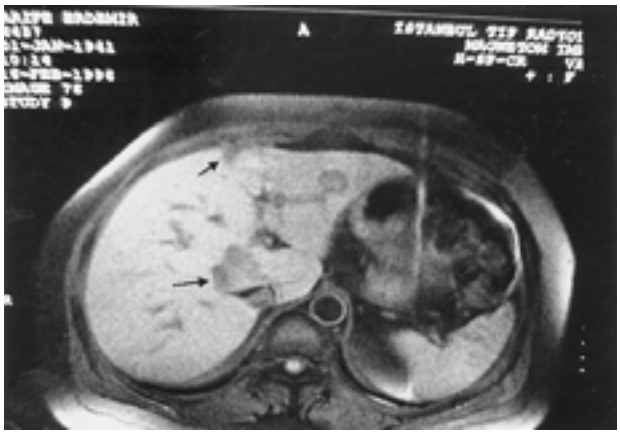


Fig. 3. MRI fat-saturation sequence of the image in Figure 2 (February 1996)

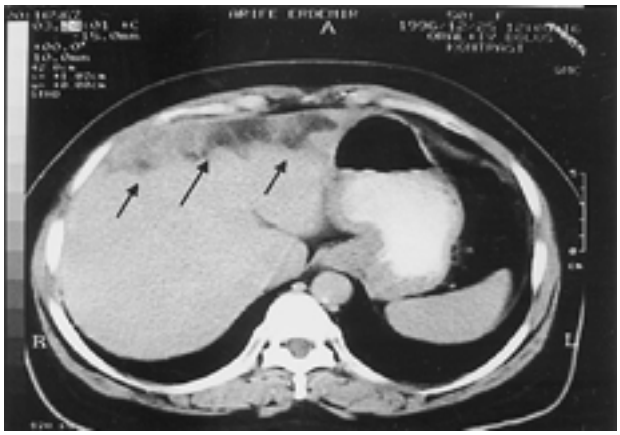


Fig.4. Control CT image (December 1996) : showing the left lobe lesion extending to the anterior surface of the right lobe. The caudate lobe lesion had disappeared.

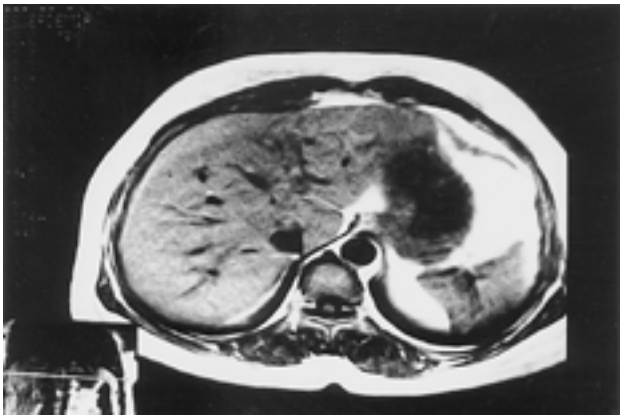
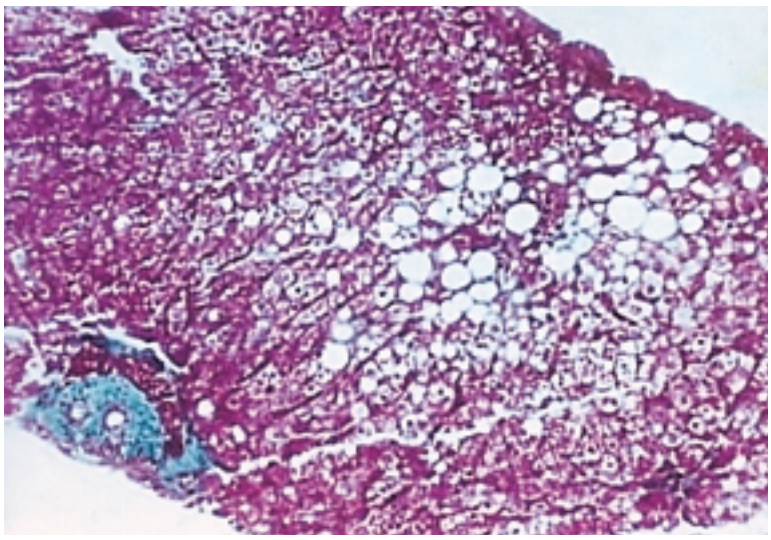


Fig.5. Final MRI image (May 1997) : all lesions had disappeared.



Picture 1. Thru-cut biopsy picture showing macrovesicular steatosis (30%) and moderate septal fibrosis (Masson trichome x 125).

DISCUSSION

Focal fatty change in the liver, which is a benign lesion, may pose important diagnostic difficulties. Various clinical and radiological criteria have been proposed for differentiating these lesions from liver neoplasms : 1) The history and clinical examination of the patient may reveal factors implicated in fatty change, such as alcohol consumption, diabetes and obesity (4). These factors are, of course, suggestive but not diagnostic. 2) Focal fatty change occurs more frequently in the periligamentous and periportal regions (5). However, any part of the liver may be involved (4) as observed in our patient. 3) Focal fatty change usually does not exert any mass effect on the surrounding normal parenchyma or the blood vessels passing through the area (5) but exceptions have been reported (6). More importantly, the absence of mass effect in some malignant neoplasms has been documented (7). 4) CT attenuation value can suggest the fatty nature of the lesion ; for example, the value af -37 HU in our patient was correctly considered compatible with fatty change. However, the overlap with malignant tumors is not insignificant and ' typical ' values may be found in the absence of steatosis. For example, Leifer *et al.* reported a case of ovarian carcinoma metastatic to the liver. In that case, the lesion met the ' absence of mass effect ' and CT attenuation criteria, but turned out to be a metastasis ; the diagnosis was finally made on biopsy which revealed little fat content (8). 5) MRI may be used for reliable detection of tissue fat (5). Unfortunately, accurate detection of fat does not rule out malignancy, only limits the extent of differential diagnosis. It is a well-known fact hepatocellular carcinoma, the most common primary malignancy of the liver may contain fat (10, 11) ; other fat-containing lesions include angiomyolipoma, myelolipoma, adenoma, liposarcoma and metastatic teratomatous liver implants (9). 6) Another property of focal fatty change is reversibility i.e. these lesions may resolve over time. The mechanism of this resolution is unclear. Sawada *et al.* suggested that the regression of the lesion in their two cases were related to metabolic control (2). In contrast, Clain *et al.* reported two diabetic patients with focal fatty change that showed ' changing appearances over time '(12) and reported that the changes in the liver were unrelated to the improvement in diabetic control. In our patient, it is difficult to ascribe the changes to better diabetic control since some lesions had already started to regress when she was admitted to our clinic while new ones had started to appear. After the patient came under our supervision, her blood glucose profile was much improved but this was not paralleled by liver changes. Reversibility, although of academic interest, has limited value in a clinical setting where management decisions must be made.

To our knowledge, the discordant evolution of individual FFC lesions in the same patient i.e. regression in one lesion with appearance or progression of other lesions, has been reported in only one previous case (12). These observations are important for discussions on the etiology of FFC because a ' purely metabolic ' hypothesis can not account for the discordance of these changes.

The diagnostic problem posed by FFC is not limited to the misdiagnosis of a malignancy as FFC ; the opposite is also possible. FFC may mimic metastatic disease (13-15), cause errors in the evaluation of response to therapy (15) and lead to mismanagement (13, 15). For example, Lilenbaum *et al.* reported a renal cell carcinoma patient who developed FFC (initially diagnosed as a liver metastasis) during the course of interleukin-2 treatment. The authors warn that ' Potential misdiagnosis of these lesions may lead to premature discontinuation of IL-2 in patients who might otherwise benefit from continuing treatment '(15).

Fine needle biopsy (FNB) has proved to be an effective tool in establishing the diagnosis (14-16). Caturelli *et al.* reported the most extensive experi-

ence. In 17 patients (7 had previous malignancies), the possibility of FFC was considered based on ultrasonographic findings and the diagnosis was made with FNB. Follow-up confirmed the evaluation in every case.

In conclusion, the diagnosis of focal fatty change can be strongly suggested by clinical, biochemical and radiologic criteria. However, an exact diagnosis can only be made with fine needle biopsy. This should be performed without hesitation in all patients in whom a change in treatment based on histopathology is possible.

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