

## Multifocal fatty infiltration of the liver ; an aspecific presentation form of hepatitis C infection

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### Abstract

We present the case report of a 60 year old man with multiple focal echogenic lesions on ultrasound. While CT and MRI suggested the diagnosis of focal fatty infiltration of the liver, histology and serology showed a chronic hepatitis C infection.

This is to our knowledge the first case of a patient with hepatitis C infection in whom focal steatosis could be seen on different imaging techniques. (*Acta gastroenterol. belg.*, 1998, 61, 379-381).

**Key words :** hepatitis C, focal fatty infiltration, steatosis.

### Introduction

Fatty infiltration of the liver is a common finding in patients with dysmetabolic and hepatotoxic conditions (1) (table I). Usually this condition is readily recognized by ultrasonography or CT. Focal accumulation of fat in the liver is less frequent, and it is important to distinguish this benign condition from metastatic involvement. The differential diagnosis of echogenic liver lesions on ultrasound includes further hemangioma, adenoma, focal nodular hyperplasia and hepatoma. However when the lesions are multiple these lesions become less likely (2).

Table I. — Systemic conditions associated with fatty infiltration of the liver

— Ethanol abuse
— Diabetes mellitus
— Obesity
— Pregnancy
— Hyperalimentation
— Kwashiorkor
— Reye syndrome
— Cystic fibrosis
— Jejunioleal bypass surgery
— Administration of steroids and hepatotoxic drugs.

Chronic hepatitis C infection, when there is no evolution to cirrhosis, is not known to induce specific images on ultrasound, CT or MRI. However it can cause a range of hepatic histopathologic changes, and steatosis, portal lymphoid aggregates and bile duct injury, while not specific, are very characteristic of chronic hepatitis C (3-5).

We present a case of multifocal fatty infiltration of the liver simulating metastatic disease in a patient with chronic hepatitis C.

### Case report

A 60 year old man was seen for a general check up. In his past history, he had a hip operation at the age of 14 year. During that operation the patient received some packed cells of blood. When he was 52 years old, he was seen by a cardiologist for aspecific thoracic pain. On that occasion abnormal liver function tests were found.

There was no history of obesity, drug or alcohol abuse, nor diabetes mellitus. The clinical examination was unremarkable. Apart from abnormal liver function tests (table II), the blood examination was normal, especially levels of alfa-foetoprotein, cholesterol, triglyceride, glucose and HbA1c were normal. On ultrasound (fig. 1) of the liver, multiple small (2-3 cm) hyper-echogenic lesions with angulated, geometric interdigitating margins were seen in segment VII ; they were thought to represent multiple hemangiomas or metastatic disease. A CT of the liver (fig. 2) confirmed the lesions : there was no enhancement after intravenous contrast, the density was -20 Hounsfield Units ; the lesions were limited to segment VII of the liver. MRI T1 and T2 imaging showed no abnormal lesions. A fat suppressed MRI (fig. 3) showed lower attenuation in the region of the focal lesions.

Table II. — Liver function test in our case

— AST :	45 U/l (nl. : < 37)
— ALT :	74 U/l (nl. : < 40)
— gamma GT :	119 U/l (nl. : < 49)
— Alkaline phosphatase :	58 U/l (nl. : 53-125)
— Bilirubine :	0.46 mg/dl (nl. : 0.04-1.13)

An ultrasound guided biopsy of one of the lesions was performed and showed steatosis of the hepatocytes with lymphoid aggregates, suggestive of hepatitis C infection. Hepatitis C antibodies and hepatitis C RNA were positive. The patient refused treatment. Twelve months later, the patient still feels good and the ultrasound of the liver shows no change.

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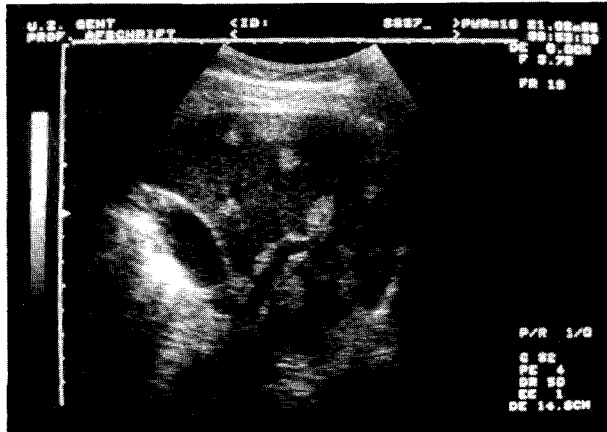


Fig. 1. — Ultrasound of the liver : Multiple hyperechogenic lesions.



Fig. 2. — CT scan of the liver : hypointense lesions in segment VII of the liver with no enhancement after intravenous contrast.

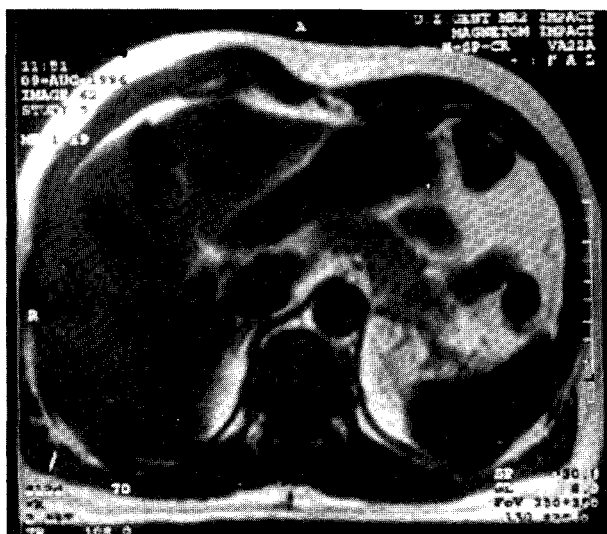


Fig. 3. — Fat suppressed MRI T1 image shows focal hypointense lesions in segment VII of the liver.

## Discussion

Fatty infiltration of the liver is a well-described pathologic entity. It is associated with a number of systemic conditions (table I). Generally it is a diffuse process. More rarely it is a localized abnormality that can involve the liver in a number of ways : a solitary focal fatty infiltration in an otherwise normal-appearing liver, generalized fatty infiltration with focal sparing or multiple foci of fatty infiltration in an otherwise normal liver (1). Any of these possibilities can simulate primary or metastatic disease of the liver. In this context it is very important to exclude malignant or metastatic disease.

On ultrasound, echogenic areas with angulated, geometric interdigitating margins are highly suggestive of focal fatty infiltration. Both ultrasound and CT frequently show nonspherical peripheral lesions in a segmental distribution within the liver (2). This segmental distribution reflects regional differences in perfusion : areas of decreased portal flow tend to accumulate less fat than better perfused areas. Thus in focal or segmental distribution, fatty infiltration may represent hepatic parenchyma with better portal perfusion (6). Further characteristics of focal fatty infiltration are a wedge shape, lack of mass effect and the presence of normal vascular structures. Regions of fatty liver that are small may be especially difficult to distinguish from malignant lesions ; since small tumors do not show mass effect or obvious exclusion of hepatic vessels (6). In our case the uncommon diagnosis of a fatty degenerated hepatocellular carcinoma was excluded by the normal alfa-foetoprotein level (although some hepatocellular carcinomas produce no alfa-foetoprotein), the histological findings and a tumor-free follow up of 1.5 years.

Conventional MRI images are relative insensitive to mild or moderate fatty infiltration. A suspicious zone of decreased attenuation seen on a CT scan is likely to represent focal fatty infiltration if it appears normal on T2 MRI images. Chemical shift MRI (opposed phase or fat suppressed) allows confident diagnosis of fatty hepatic abnormalities and is therefore recommended in instances where focal or diffuse fatty liver is considered for differential diagnosis. Chemical shift imaging techniques allow separation of the signals from triglyceride and water protons based on differences in resonance frequency (ie. chemical shift). These techniques allow an absolute diagnosis of focal or diffuse fatty infiltration (6).

Steatosis is often seen on liver biopsy in patient with hepatitis C (31-57% of the cases) (3-5). Together with bile duct lesions and lymphoid aggregates, these lesions are very suggestive for hepatitis C infection, although not pathognomonic. In non cirrhotic stages, imaging of the liver is mostly normal.

Whereas steatosis is often seen on histology, we think, to our knowledge, we present the first case of chronic hepatitis C infection with focal steatosis on

ultrasound and CT of the liver. A similar picture was described by Vieco *et al.* in a HIV positive patient with a CMV hepatitis (2).

As a conclusion we describe a patient with chronic hepatitis C who had multiple focal steatotic lesions of the liver. Although imaging techniques and especially chemical shift technique MRI can be very helpful for the diagnosis, a liver biopsy confirms the diagnosis and in cases of hepatitis establishes the damage made by the hepatitis C virus.

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