Looking at fatty liver

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This clinic is designed to help you to see what the radiologist sees. It is not intended to be a comprehensive discussion of a given condition, but a guide to the radiological features. What do these images tell you?

Case presentation

The images in this clinic are from different patients. Some people were asymptomatic; others had raised liver function tests or mild abdominal pain.

Modalities

The two principal modalities used for assessing fatty liver are ultrasound and CT. The definitive and most accurate assessment is by the pathologist after biopsy; however, this requires an invasive procedure and has associated risks.

What the terms mean

Hyperechoic
An increase in echogenicity – the area appears white or whiter

Hypodense on CT
A decrease in density – the area appears dark or darker

Hyperdense on CT
An increase in density – the area appears white or whiter

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Preparation

Ultrasound

- No fizzy drinks for 24 hours before the procedure
- Fast for four hours before the procedure.

CT scan

- Fast for four hours before the procedure.

Technique

Ultrasound

A skilled sonographer is required. Both lobes of the liver are examined thoroughly in both the transverse and sagittal planes.

CT scan

Noncontrast scans of the liver are preferable. The density (or more specifically, the linear attenuation coefficient or CT number) of selected small areas in the liver and spleen are measured. The measurement is expressed in Hounsfield units (in recognition of GN Hounsfield, the inventor of computed tomography).

Background

There can be diffuse or focal (sometimes multiple) areas of fatty infiltration throughout the liver.

Ultrasonic signs

Signs of a fatty liver include:

- an increase in echogenicity compared with the kidney
- decreased visualisation of borders of portal vessels
- increased sound attenuation (poor definition of the deeper aspects of the liver).

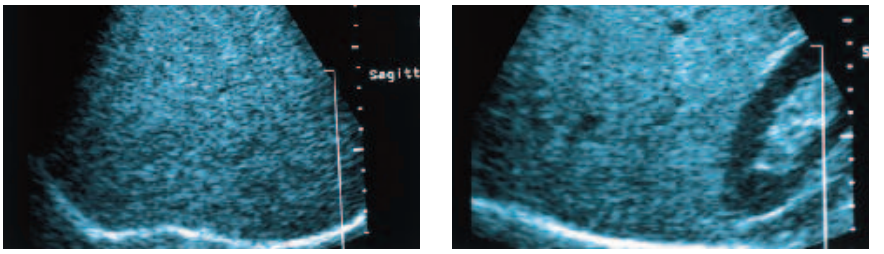
CT signs

CT signs of fatty liver include:

- a decrease in density of the liver (that is, a hypodense liver)
- reversal of liver–spleen density when Hounsfield units are calculated – the liver is more hypodense than the spleen (normally it is the opposite way around)
- hyperdense intrahepatic vascular structures.

Key points

Both ultrasound and CT can be used to assess fatty liver; however, CT is more accurate as it allows specific measurements to be taken. MT



Figures 1a and b. Ultrasound showing increased echogenicity of the liver, with poor definition of the portal vessels (the latter usually having 'white' margins).

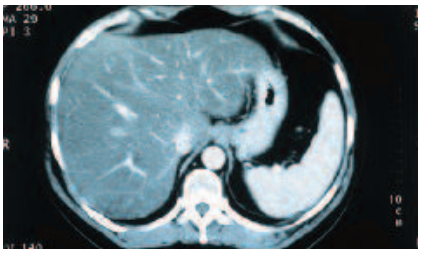


Figure 2. CT scan showing decrease in density of the liver in relation to the spleen.