

HEPATIC STEATOSIS A SILENT EPIDEMIC

Hepatic steatosis, also known as fatty liver or fatty liver disease (FLD), is a very common finding on cross-sectional imaging. Ultrasound scanning, computed tomography (CT) and magnetic resonance imaging (MRI) are all highly sensitive and specific for detection of fat accumulation in the liver. Of these modalities, ultrasound is most commonly utilised because it is economical and accessible (Fig.1). Steatosis or FLD can be classified into alcoholic (AFLD) and non-alcoholic (NAFLD) types.



Fig 1. A sagittal US image showing the liver and the right kidney. Note the major difference between the echogenicity of the liver and that of the kidney. The liver shows a generalised increase in echogenicity with reduced through-transmission of sound.

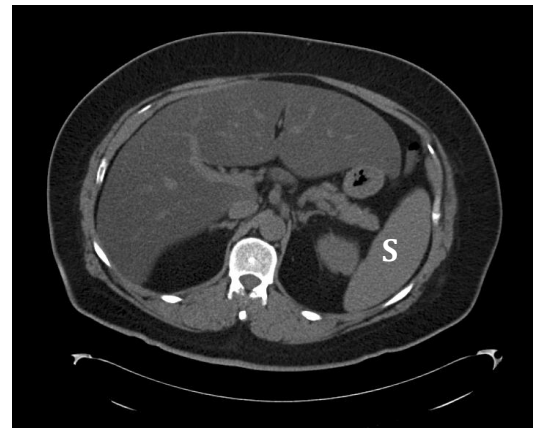


Fig 2. CT scan image of the liver and spleen. Note the low density of the hepatic parenchyma indicating diffuse steatosis. Contrast this with the higher density of the normal spleen. (S = spleen)

Frequent imaging patterns of hepatic steatosis include focal fat deposition in an otherwise normal liver, diffuse fat deposition (Fig. 2) and diffuse fat deposition with focal or patchy sparing (Fig. 3), which may be periportal (Fig. 4), pericholic or peripheral. Awareness of these patterns helps to avoid diagnostic errors.

The preferred nomenclature is "hepatic steatosis" or "fatty liver disease". "Fatty infiltration" and "fatty degeneration" of the liver are unfortunate terms as fat (triglyceride) is actually deposited in cytoplasmic vacuoles within hepatocytes, a process called steatosis.

Steatosis reportedly occurs in up to 35% of the general population in various countries and 80% of obese individuals.

Elevated liver biochemistry is said to be found in about 50% of patients with simple steatosis.

Hepatic steatosis can be a harmless benign condition and is initially reversible but some such patients will progress to a form of hepatic inflammation (steatohepatitis) and fibrosis (cirrhosis). The extent of inflammation and fibrosis varies widely and does not correlate with the degree of fat accumulation. In addition, up to 10% of cases of cirrhotic alcoholic fatty liver disease will go on to develop hepatocellular carcinoma.



Fig 3. This transverse US image demonstrates echogenic hepatic steatosis with patchy sparing of liver parenchyma.



Fig 4. A transverse US image of the liver with steatosis and periportal sparing. (PV = portal vein)

Despite multiple causes, steatosis can be considered a single condition which commonly occurs in patients with excessive alcohol intake and those who are obese or have metabolic syndrome (diabetes, hypertension, obesity and dyslipidaemia).

Less commonly it is associated with other conditions affecting fat metabolism, including hepatitis, certain drugs (eg. steroids , methotrexate, tamoxifen), certain congenital disorders (eg : glycogen storage disorder, alpha-1 antitrypsin deficiency, cystic fibrosis) and dietary and nutritional abnormalities (eg: starvation, TPN, gastric or jejunio-ileal bypass surgery and inflammatory bowel disease).

Incidentally, fatty pancreas is not infrequently associated with fatty liver and is found on cross-sectional imaging, particularly ultrasound scans. In the pancreas, fat accumulation occurs in the interstices between acini, not within intracellular cytoplasmic vacuoles as occurs in the liver. Fat accumulation in the pancreas correlates strongly with obesity (metabolic syndrome), but has no other significance.

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INTERNATIONAL REJECTION OF BREAST THERMOGRAPHY

The Cancer Society of NZ, The NZ Breast Cancer Foundation, The National Screening Unit and the NZ Branch of the Royal Australian and New Zealand College of Radiologists have jointly issued a position statement declaring that they **do not support the use of thermography** as a breast cancer screening or diagnostic tool.

Breast thermography is not supported by the American Medical Association or American Cancer Society and is not used in the Australian or United Kingdom breast cancer screening programmes.

The International Agency for Research on Cancer states that "...the **sensitivity and specificity of thermography are poor** and its application to screening is unlikely."

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