Hepatic injury and cirrhosis

رابط قناة ترجمة ملا زم قسم الا شعة اضغط هنا

- The liver is an organ that sits just under the rib cage on the right side of the abdomen. It can weigh up to 4 pounds (1.8 kilograms). The liver is needed to help digest food, rid the body of waste products and make substances, called clotting factors, that keep the blood flowing well, among other tasks.

- Liver disease can be passed through families, called inherited. Anything that damages the liver also can cause liver problems, including viruses, alcohol use and obesity.

- The liver is highly susceptible to toxic, infectious, and metabolic injury.

- Chronic injury may lead to fibrosis and eventually cirrhosis, which distorts hepatic architecture. Radiologic and histologic correlation is essential for diagnosis and staging.

Hepatic injury patterns

- There are four major types of liver injury: hepatocellular, autoimmune, cholestatic, and infiltrative.

- A hepatocellular pattern is marked by isolated or predominant elevations of serum transaminases.

- Cholestatic and infiltrative patterns, in contrast, have elevation in serum alkaline phosphatase with normal or mild elevations in serum transaminases. Markedly elevated bilirubin levels found in cholestatic diseases further differentiate between cholestatic and infiltrative patterns.

cirrhoses

- serious condition in which the liver is damaged and scarred, leading to liver failure.

Causes of cirrhosis

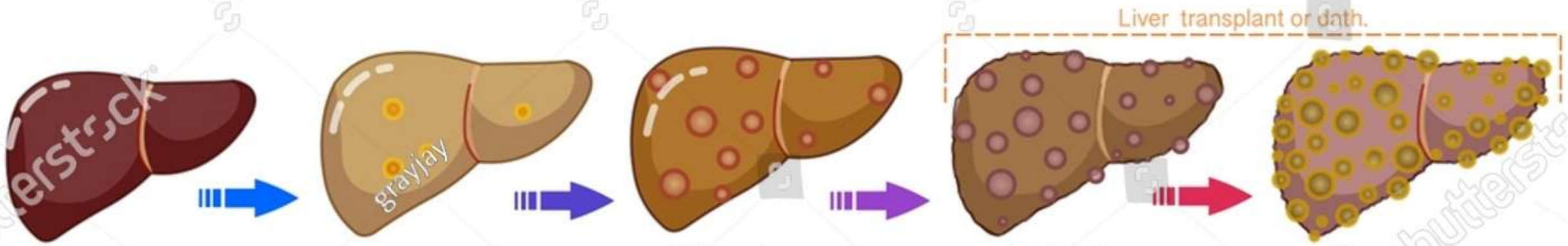
Cirrhosis is most commonly caused by chronic liver diseases, such as:

- Chronic hepatitis B or C infection
- Nonalcoholic fatty liver disease (NAFLD)
- Alcohol abuse

Other less common causes of cirrhosis include:

- Autoimmune diseases
- Certain medications
- Inherited conditions

Stages of Liver Failure



Healthy Liver

Fatty Liver

In this early stage, the liver is enlarged or inflamed.

Fibrosis Liver

Severe scarring has built up, making it difficult for the liver to function properly.

Cirrhosis Liver

Liver function has deteriorated to the point where the damage can't be reversed other than with a liver transplant.

Cancer Liver

The development and multiplication of unhealthy cells in the liver can occur at any stage of liver failure, although people with cirrhosis are more at risk.

This is a CT scan (axial view) of the upper abdomen, showing characteristic radiologic features of hepatic cirrhosis with portal hypertension.

Radiologic Description:

Liver:

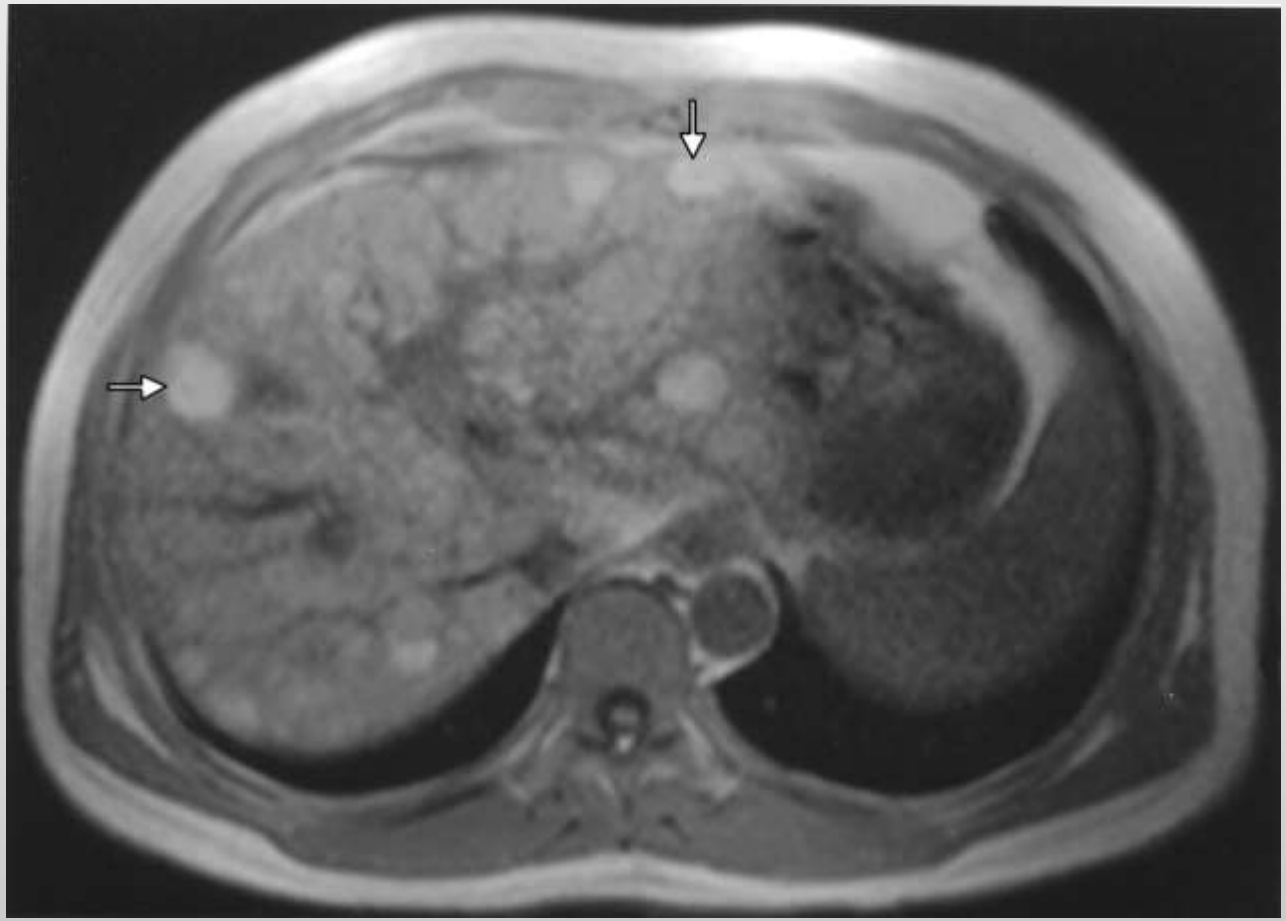
The hepatic surface appears irregular and nodular, indicating architectural distortion due to fibrosis and regenerative nodules.

The right lobe is relatively atrophic, while the left and caudate lobes are relatively preserved or enlarged — a classic pattern in cirrhosis.

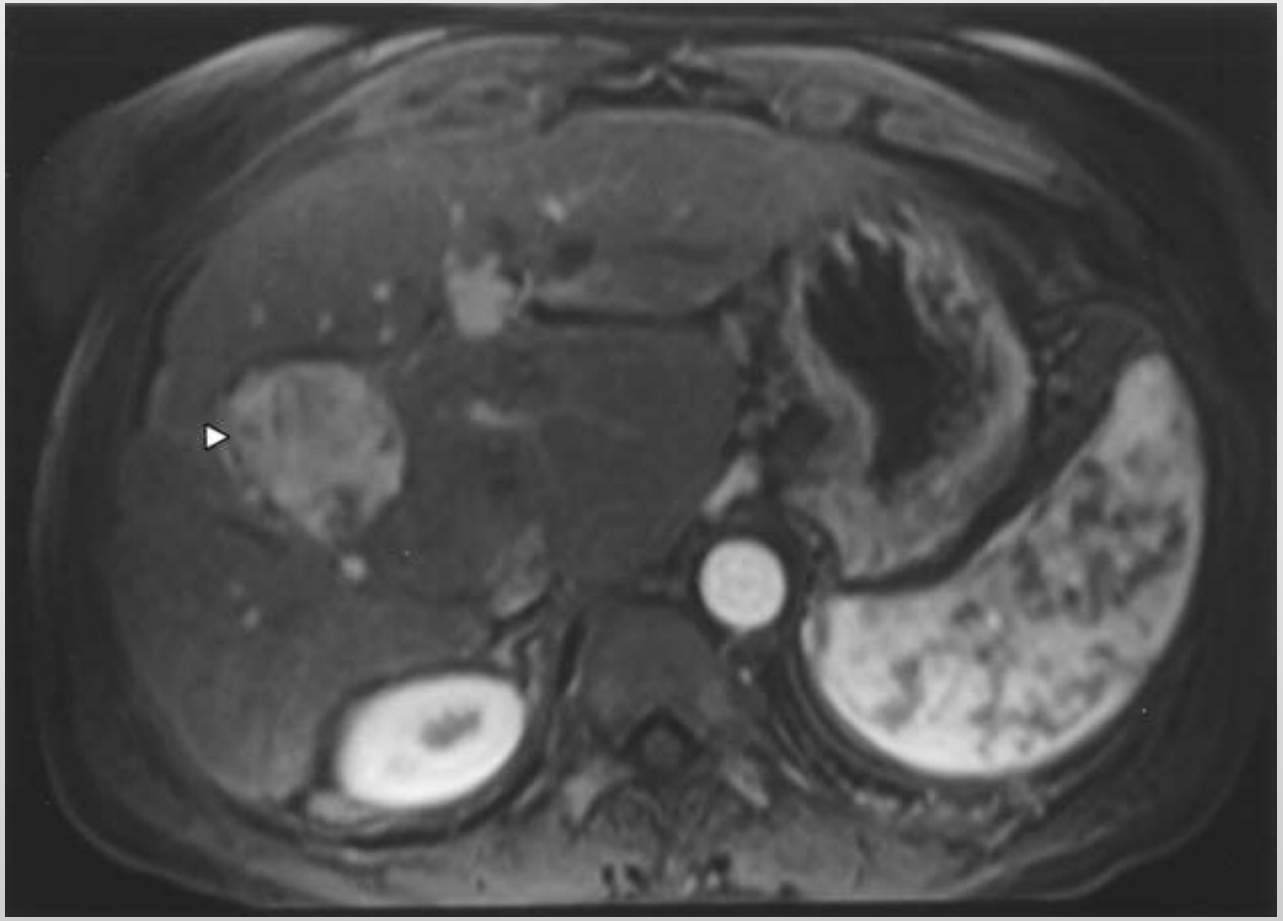
Spleen:

The spleen is enlarged (splenomegaly) — a key indicator of portal hypertension.

33-year-old man with viral cirrhosis. Axial breath-hold gradient-echo T1-weighted MR image shows diffuse nodules with distinct larger nodules that are hyperintense to background parenchyma (*arrows*). Patient also had evidence of portal hypertension



- 53-year-old woman with cirrhosis and hepatocellular carcinoma. Axial breath-hold contrast-enhanced fat-suppressed 3D MR image obtained in hepatic arterial dominant phase shows enhancement of hepatocellular carcinoma



- 74-year-old woman with metastatic B-cell lymphoma. Axial breath-hold contrast-enhanced fat-suppressed 3D MR image obtained in portal venous phase shows lobulated contour and areas of linear enhancing fibrosis (*arrows*), mimicking cirrhosis.

Liver failure can be caused by a variety of factors, including:

- Chronic liver diseases, such as cirrhosis, hepatitis B or C, and nonalcoholic fatty liver disease (NAFLD)
- Acute liver injury, such as from drug overdose, viral infection, or exposure to toxins
- Genetic conditions, such as Wilson's disease and hemochromatosis
- Autoimmune diseases, such as autoimmune hepatitis
- Blockage of the bile ducts

Symptoms of liver failure can vary depending on the cause and severity of the condition. Common symptoms includ

- Jaundice (yellowing of the skin and eyes)
- Fatigue
- Weakness
- Loss of appetite
- Nausea
- Vomiting
- Abdominal pain

Jaundice is a condition that causes your skin, the whites of your eyes, and mucous membranes to turn yellow. This yellowing happens because of a buildup of bilirubin in your blood. Bilirubin is a yellow substance produced when your body breaks down old red blood cells.

Normally, your liver processes bilirubin and helps your body get rid of it in your stool. However, if your liver isn't working properly or there's a blockage in the bile ducts (tubes that carry bile from your liver to your intestines), bilirubin can build up and cause jaundice.

Neonatal jaundice

Physiological jaundice

- Newborn babies are often affected by jaundice, which makes their skin and eyes have a yellowish tinge. Jaundice is caused by a build-up of a chemical called bilirubin in the baby’s blood and tissues.

- Bilirubin is a waste product of the body’s break-down of old and damaged red blood cells. The liver helps to eliminate bilirubin as waste. In the mother’s uterus, the baby's bilirubin is sent down the umbilical cord and eliminated by the mother's body.

- After birth, the baby's liver has to eliminate the bilirubin itself, and it can take a few days for the liver to function at full speed. In the meantime, the excess bilirubin in the baby's body causes symptoms of jaundice.

Breast milk jaundice

- The exact cause of breast milk jaundice is not fully understood, but it is thought to be related to factors in breast milk that affect bilirubin metabolism.
- It typically appears after the first week of life.
- It is generally harmless and does not require treatment in most cases.
- However, if bilirubin levels become very high, it can lead to serious complications.

Breastfeeding Jaundice

This occurs in the first week of life due to insufficient milk intake, leading to decreased bilirubin excretion. It often improves with frequent breastfeeding.

Pathological jaundice

There are many different causes of pathological jaundice, including:

•Blood type incompatibility: This occurs when the mother's blood type is different from the baby's blood type. The mother's immune system may attack the baby's red blood cells, causing them to break down and release bilirubin.

•Infections: Infections, such as sepsis or urinary tract infection, can also cause red blood cells to break down and release bilirubin.

•Enzyme deficiencies: Some babies are born with enzyme deficiencies that make it difficult for them to process bilirubin.

•Liver problems: Problems with the liver, such as biliary atresia or hepatitis, can also lead to jaundice.

Steatosis (Fatty Change)

- Accumulation of fat droplets in hepatocytes.
- Seen in alcoholic liver disease, obesity, diabetes.
- Radiology: hyperechoic liver, reduced attenuation on CT.

This axial CT scan of the upper abdomen demonstrates typical features of hepatic steatosis (fatty liver disease) — a common and usually reversible hepatic condition.

Radiologic Description

Liver:

The liver appears hypodense (darker) compared to the adjacent spleen.

This reduced attenuation indicates fat accumulation within hepatocytes (intrahepatic fat infiltration).

The hepatic margins are smooth, and there is no architectural distortion—suggesting simple or moderate steatosis rather than cirrhosis.

Spleen:

The spleen shows normal density and serves as a reference organ.

Normally, the liver and spleen have similar attenuation (within 8–10 HU).In this image, the liver is significantly less dense than the spleen, confirming fatty change.

Gallbladder and adjacent organs:

Appear normal with no biliary dilatation or ascites.