

cirrhosis of the liver

- What is cirrhosis?

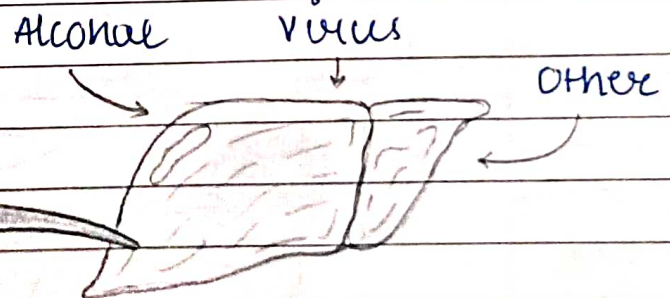
When cells are injured or damaged and die off the dead tissue that was previously full of living cells becomes **FIBROTIC (thickened with lots of protein)** and forms scarred tissue.

similarly, when your liver is constantly forced to process alcohol, or a viral attack for a long time or anything else, that causes a long-term chronic state of liver cells, the liver cells

chronic scarring + damage

not reversible.

At this point, the liver becomes fibrotic and we call it **CIRRHOSIS OF THE LIVER**. It is not reversible and it is also called as "End-stage damage."



When liver cells are injured, they start to come together and form "**regenerative colonies of living liver cells** ← **nodules**"

(* classic signs of cirrhosis) (* Bumpy liver).

- How does fibrotic tissue and collagen form?
Fibrosis is process mediated by some special cells called **STELLATE CELLS**, which are present between **SINUSOID** and **HEPATOCYTES** in **PERISINUSOIDAL SPACE**.

The stellate cells ~ store vitamin A

~ Dormant

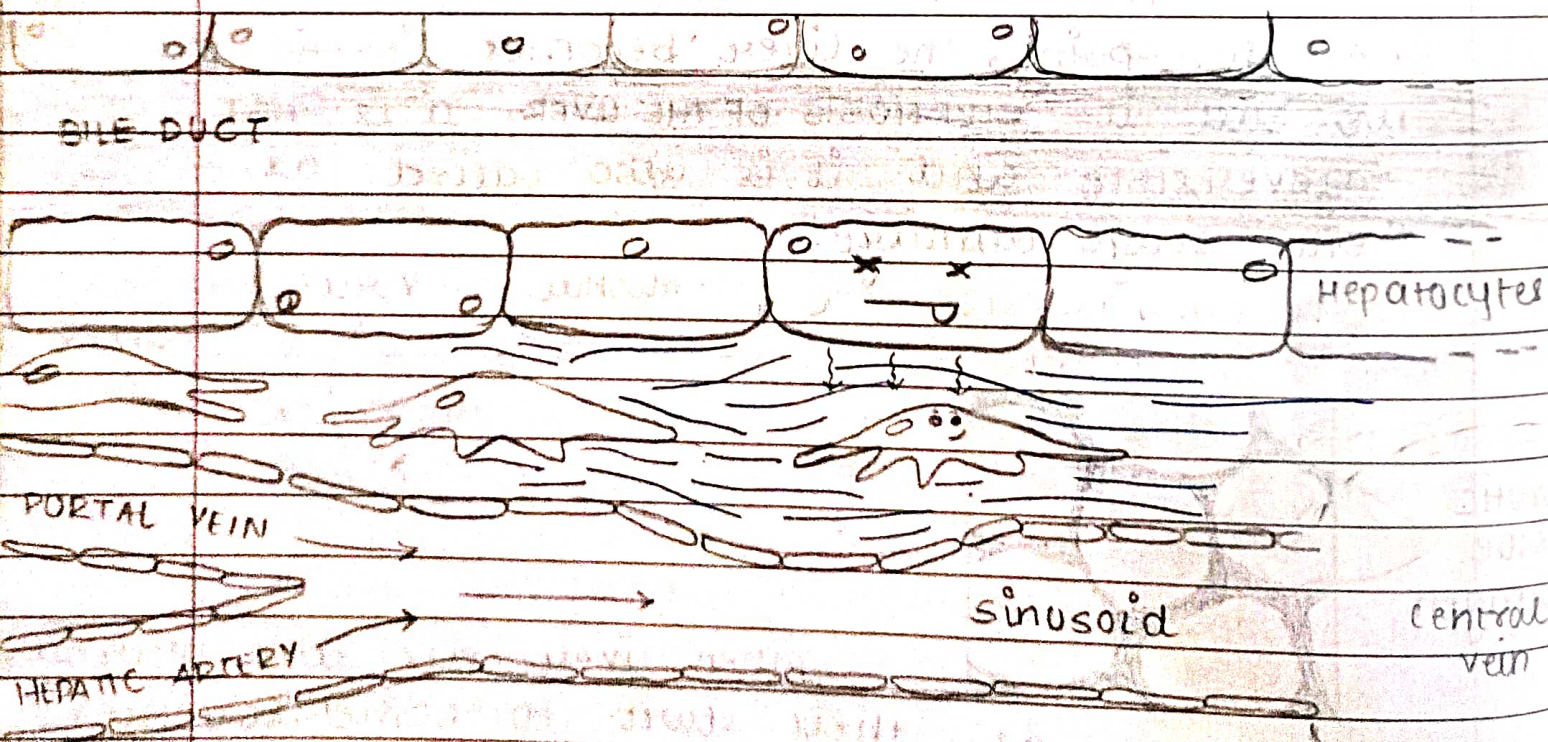
~ Activate after injury

~ secrete "transforming growth factor" or **TGF- β** .

Portal vein
+ Hepatic artery
+ Bile duct
= **Portal triad**

compress the
central vein in
sinusoid

← produces collagen.



Normal liver - wound healing
constantly injured - constant fibrosis which
liver makes it bumpy.

DATE: / /

The compression caused by the production of fibrotic tissue, the pressure starts to build up on the sinusoid vein, which leads to intrasinusoidal or portal hypertension.

The fluid in the blood vessel is more likely to be pushed into tissues and across large open spaces.
i.e. PERITONEAL CAVITY.

Higher pressure in the portal vein.

(excess peritoneal fluid)
ASCITES

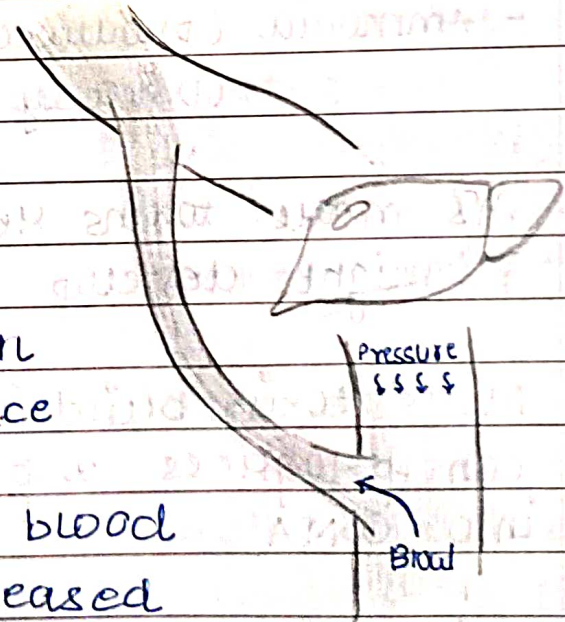
CONGESTIVE SPLENOMEGALY
(fluid backs up into the spleen as it can't go into the liver).

Similarly,

The blood does not reach to the liver due to high portal pressure and this leads to PORTOSYSTEMIC SHUNT.

The blood flow follows the path of least resistance.

Portosystemic shunt leads to Renal vasoconstriction which increases resistance in renal circulation i.e. resulting in decreased blood flow to kidney and decreased filtration.



HEPATORENAL FAILURE. followed by LIVER FAILURE.

• Fibrosis



Increased pressure.



Portosystemic circulation reduces the no. of sinusoidal veins and functional portal triads.



Decreased liver function



Decreased detoxification of the blood.

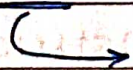


[The toxins reach the brain and start causing mental deficits i.e. Hepatic encephalopathy.

→ TOXINS:

- Ammonia (produced in the GI tract)
(usually metabolized in the liver)

As more toxins reach the brain, the patients might develop ASTERIXIS



More toxin build up → Tremoring and jerky hand when they are outstretched.
can progress a patient into COMA

• Liver is responsible for estrogen metabolism but here, its metabolism decreases.

Increased estrogen in blood:

- ~ Gynecomastia (in male) (female like features)
- ~ Spider angiomas
- ~ Palmar erythema

◦ Decreased Bilirubin conjugation lead to :
~ Increased unconjugated bilirubin in the blood
~ Jaundice.

◦ Decreased Albumin production leads to :
~ Hypoalbuminemia.

◦ Decreased Clotting factor production leads to coagulation issues.

CLINICAL FEATURES :

- Early stage -

~ some fibrosis (compensated fibrosis) (cirrhosis)

*** Liver can still do its some jobs***

→ can be asymptomatic

→ Non-specific symptoms (couldn't be identified easily)

~ weight loss ; weakness ; fatigue.

- Later stage -

~ Extensive fibrosis (decompensated cirrhosis)

*** can't function normally***

→ Jaundice and Pruritus (ITCHY SKIN).

→ Ascites

→ Hepatic encephalopathy leading to confusion.

→ Easy bruising. due to low coagulation factors.

DIAGNOSIS :

(1) Liver biopsy

(2) Laboratory findings :

~ Elevated bilirubin

~ Elevated enzymes →

~ $AST > ALT$

• ALT

• AST

• ALP

• GGT

~ Thrombocytopenia (Low platelets)

TREATMENT:

Generally, scarring and cirrhosis is irreversible.

~ Prevent any further damage

- Treating underlying cause.

Eg: Alcohol cessation

stop anti-viral treatment for Hepatitis C

~ Liver transplant.