



3<sup>rd</sup> PBL case:

Liver cirrhosis &  
Portal hypertension



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# + Learning objectives

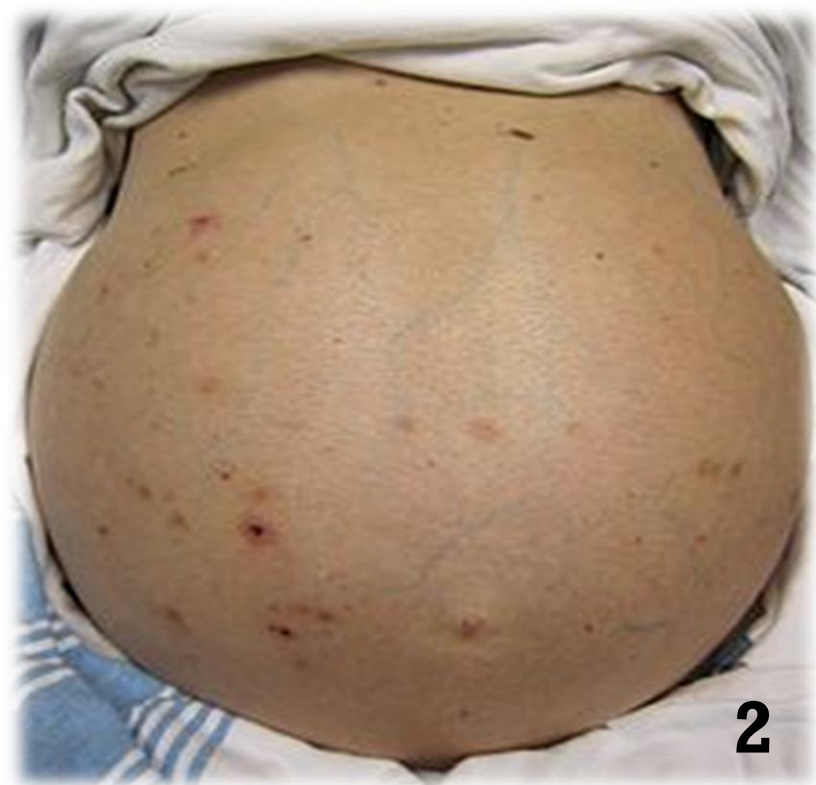
- Correlate anatomical structure and cells of the liver with their function.
- discuss the pathology and pathogenesis of liver cirrhosis .
- discuss the mechanisms underlying portal hypertension Porto systemic shunt, and associated complications including esophageal varices, splenomegaly and development of ascites.
- Use basic sciences to interpret symptoms, signs and investigation results of patient with liver cirrhosis .
- discuss the pathogenesis of hematemesis in a patient with liver cirrhosis and portal hypertension .
- Discuss a brief management plan showing management goals and management options in a patient with liver cirrhosis .
- Discuss the pharmacology of drugs used in management plan.

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## New terms:

Important!

1. **Spider nevi:** many small vessels surround vascular lesions consisting of a central arteriole.
2. **Ascites:** an accumulation of fluid in the peritoneal cavity.
3. **Shifting dullness:** a sign, on physical examination, for ascites
4. **Palmar erythema:** is reddening of the palms at the thenar and hypothenar eminences.
5. **Esophageal varices:** are extremely dilated sub-mucosal veins in the lower third of the esophagus.
6. **Leukonychia:** white discoloration appearing on nails.
7. **Caput medusa:** is the appearance of distended and engorged paraumbilical veins, which are seen radiating from the umbilicus across the abdomen to join systemic veins.



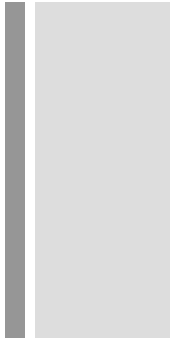




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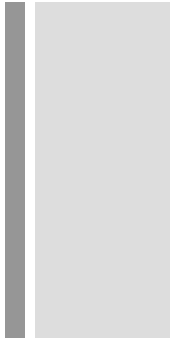
# Liver cirrhosis



- Results from an advanced liver disease. It is characterized by replacement of liver tissue by fibrosis (scar tissue) and regenerative nodules. These changes lead to loss of liver function.

# + Causes of liver cirrhosis:

- Alcoholism
- Hepatitis B
- Hepatitis C
- Fatty Liver Disease
- Idiopathic

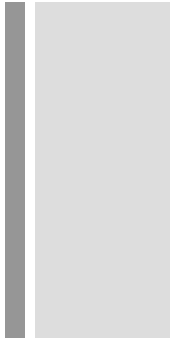


# + Sign & Symptoms of liver cirrhosis:

- Jaundice
- Spider nevi
- Palmar erythema
- Fatigue
- Gynecomasia
- Atrophic testicles
- Shrinkage liver
- Leukonychia.



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## Portal hypertension:

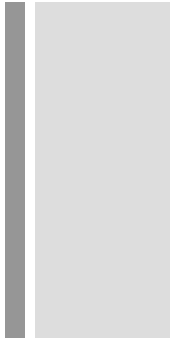
- Elevation of hepatic venous pressure gradient to  $>5\text{mmHg}$ .

## Causes of portal hypertension:

- Portal vein thrombosis
- Liver cirrhosis
- Hepatic fibrosis
- Hepatic vein thrombosis

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## Caused by portal hypertension:



- Ascites
- Esophageal varices
- Splenomegaly
- Dilated abdominal vein (Caput medusa)
- Pitting edema in the lower limb

# + Investigations:

- **CBC:** shows low Hemoglobin & low platelet.
- **Serology screening test:** indicates the virus type.
- **Liver biopsy:** (note that biopsy is contraindicated in case of long prothrombin time)
- **Low power:** Liver architectural distortion caused by hepatocellular necrosis with bridging fibrosis.
- **High Power:** inflammatory cellular injury conformed by ballooning enlargement of hepatocyte called ballooning degeneration.

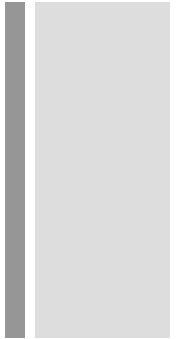
# + Investigations:

- **Ultrasound:** shows that the liver surface isn't smooth with nodularity
- **Blood biochemistry.**
- **Liver function test:**
- **High:** bilirubin, AST, ALT, ALP, gama GT, prothrombin time.
- **Low:** albumin.

Test	Normal Range
Serum bilirubin	0-19 $\mu\text{mol/L}$
AST	0-40 IU/L
ALT	0-50 IU/L
ALP	0-120 IU/L
Gamma glutamyltranspeptidase	0-50 IU/L
Serum albumin	35-50 g/L
Prothrombin time	10-14 seconds



# Treatment:

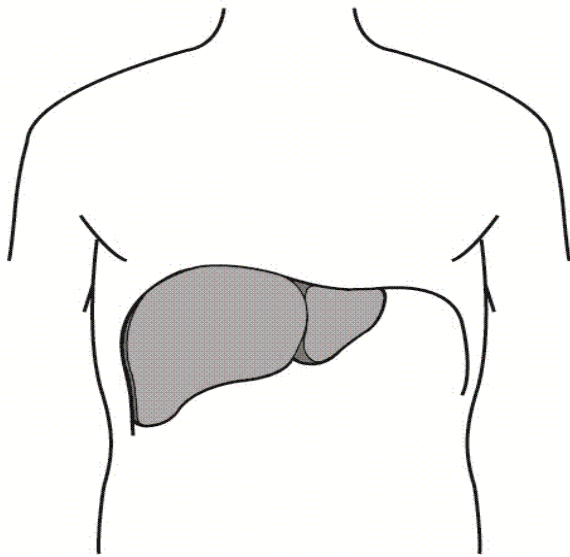


- If the patient present with bleeding we should expand his blood volume by intravenous fluid until he receive blood unites from the blood bank.
- **Octrotide**: to decrease portal vein pressure & tendency to bleeding.
- **Diuretics**: for ascites, **Beta-blocker**: to reduce the portal vein pressure, **vitamin K**: to reduce his prothrombin time.
- **Liver transplantation.**

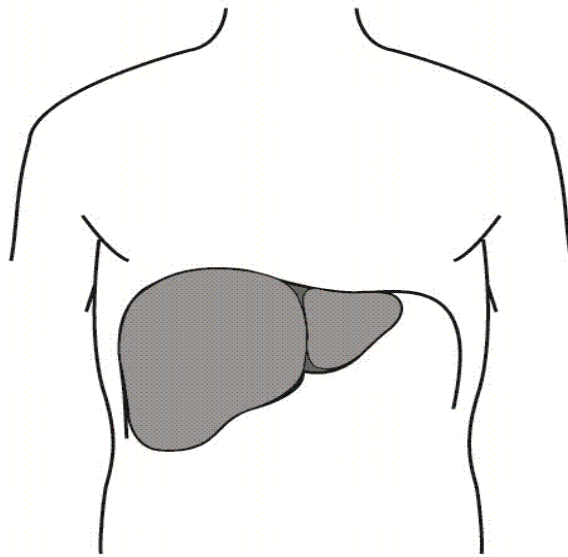
# + Notes:

- Normal liver span is 12-14 c.m

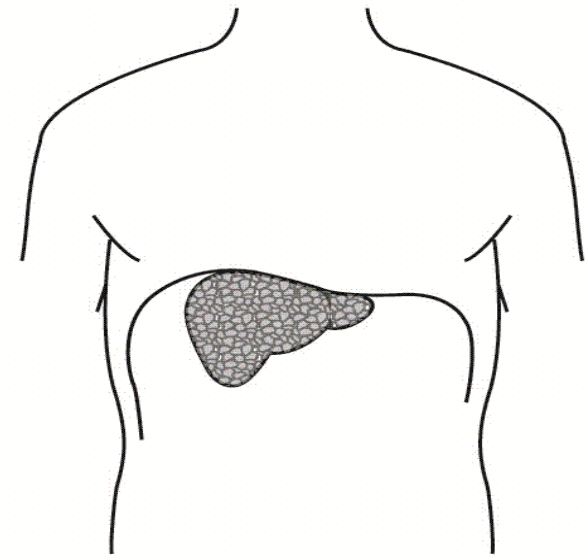
## Progression of Liver Diseases



Normal Liver



Fatty Liver  
Hepatitis



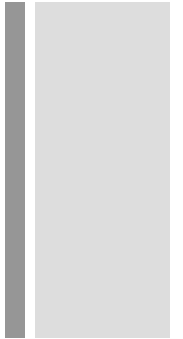
Liver Cirrhosis





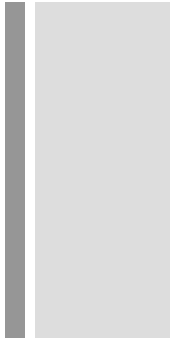
# Questions

- 1. What abnormality could cause shifting dullness?**
- 2. Name 2 possible complications of portal hypertension.**
- 3. What is the medical term for the white discoloration on nails?**
- 4. Name 3 possible causes of liver cirrhosis.**
- 5. What do you expect to see on ultrasound in case of liver cirrhosis?**
- 6. What is the benefit of giving the patient Octrotide?**
- 7. What is the most accurate way to diagnose cirrhosis**
- 8. What happens to the albumin level in case of liver cirrhosis? Why?**
- 9. Liver cirrhosis considered as reversible or irreversible condition?**
- 10. What is the best way to manage liver cirrhosis?**





# Answers



1. **Ascites.**
2. **Ascites, Esophageal varices, Splenomegaly, Caput medusa.**
3. **Leukonychia.**
4. **Alcoholism, Hepatitis C, Fatty Liver Disease.**
5. **Liver surface isn't smooth with nodularity.**
6. **Decrease the portal vein pressure & tendency to bleeding.**
7. **Liver biopsy.**
8. **Decrease, because Albumin synthesized by the liver.**
9. **Irreversible, but we can slow it down.**
10. **Liver transplantation.**