

Pathology of Liver Diseases

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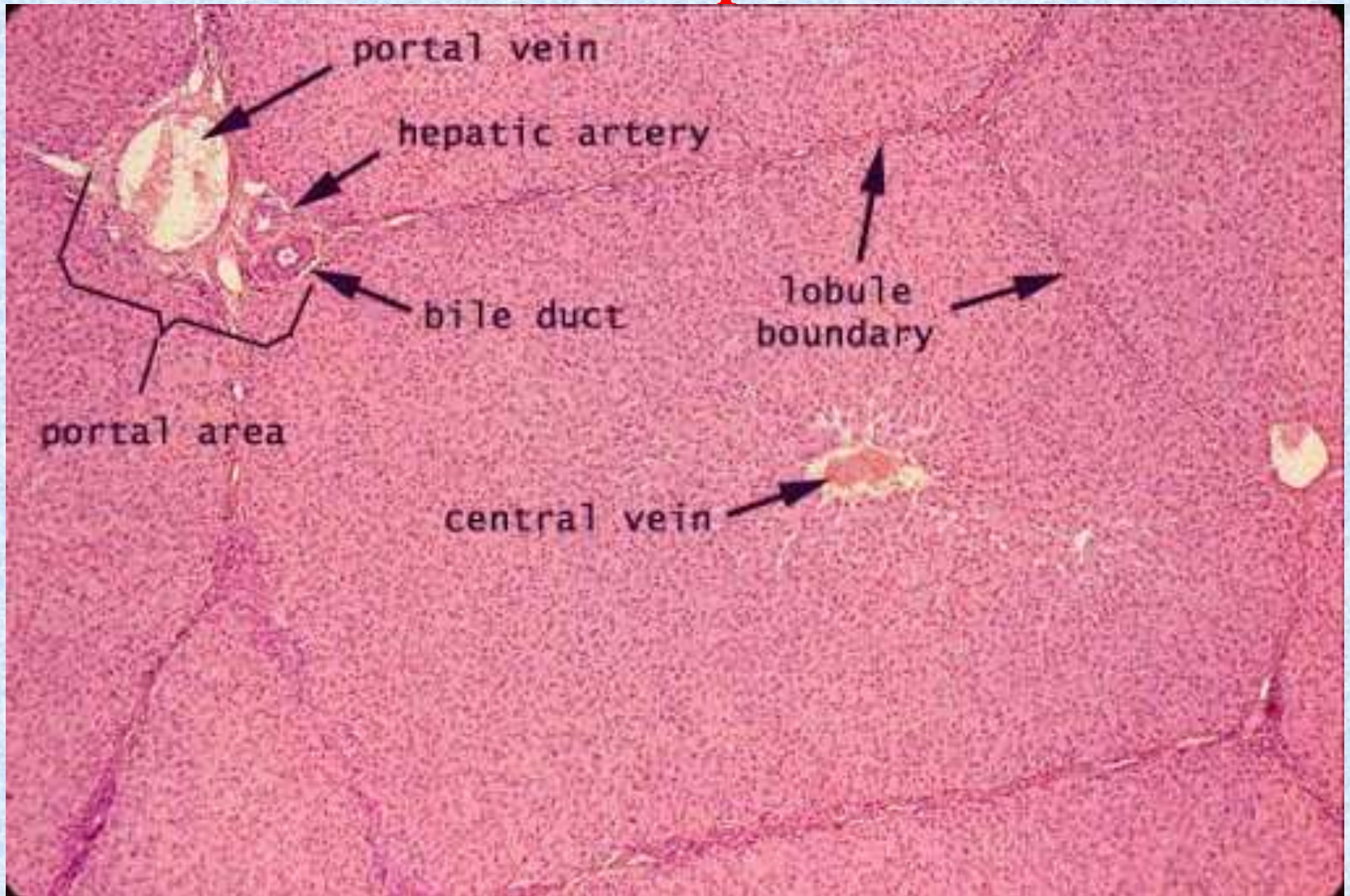
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Talks outlines

- **Introduction**
- **Liver cell injury**
- **Viral hepatitis**
- **Liver cirrhosis**
- **Tumors of the liver**

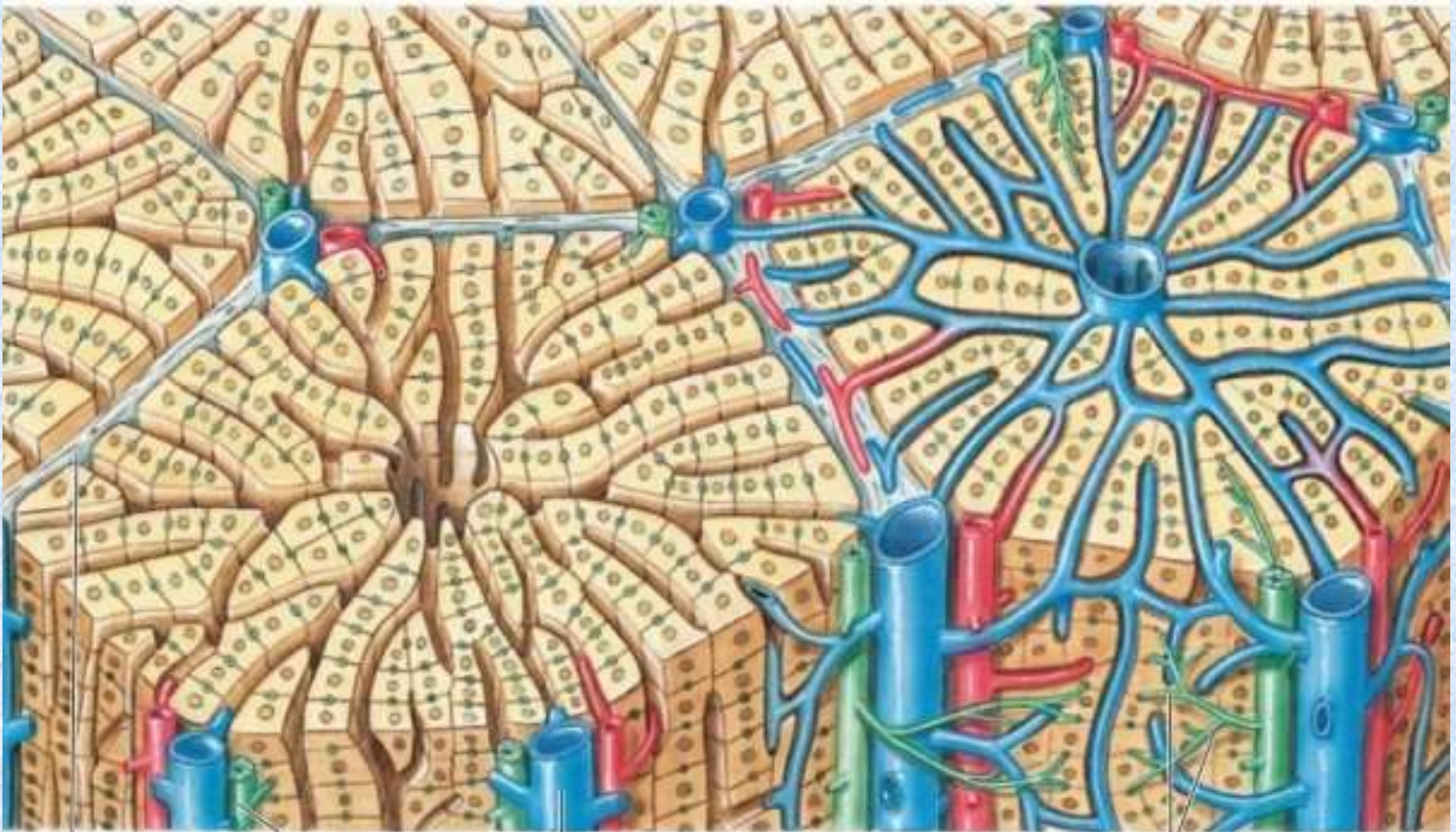
Liver diseases

Normal hepatic lobule



Liver diseases

Normal hepatic lobule



Liver diseases

Manifestations of liver diseases

Jaundice

Right hypochondrial pain

Edema and ascites

Raised liver enzymes

Hepatic coma

Liver cell injury

Liver diseases

Liver cell injury

Definition: acute or chronic damage of hepatocytes

Types and etiology:

1- Necrosis: caused mainly by

- Drugs as: Acetamenophen, allopurinol. Amiodarone, and NSAID
- Severe acute hepatitis (fulminant hepatitis).

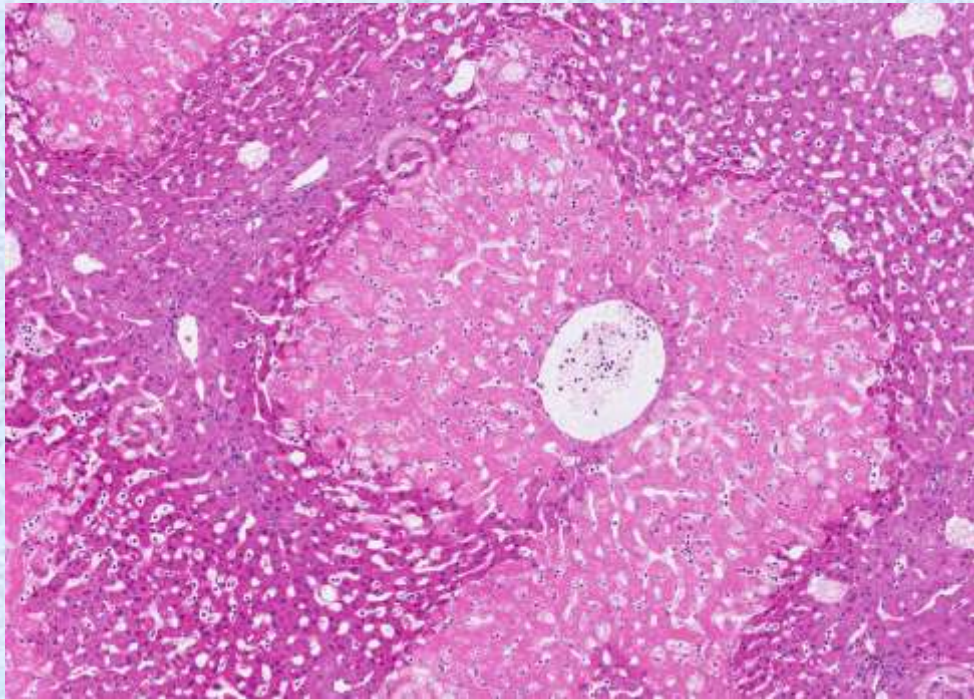
2- Apoptosis: occurs mainly in chronic liver lesions as in

- Chronic viral hepatitis
- Chronic venous congestion of the liver

Liver diseases

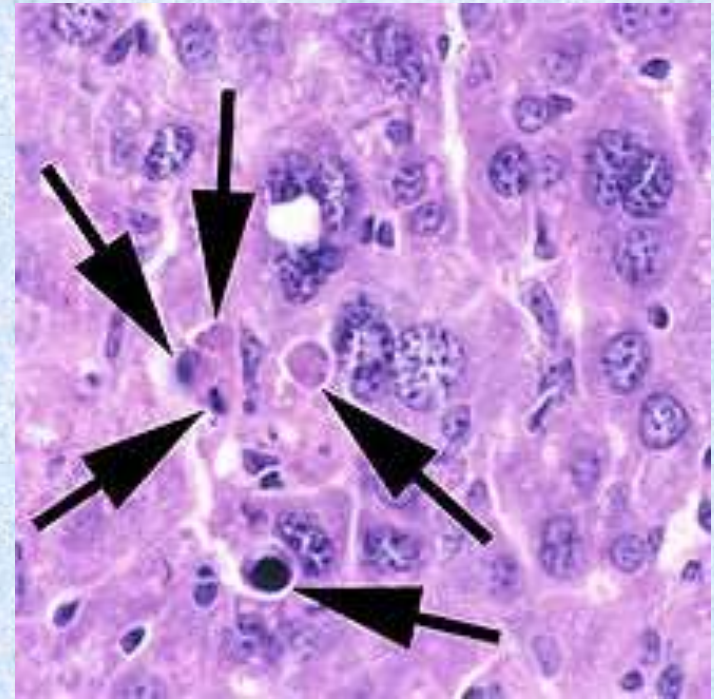
Liver cell injury

Microscopic features:



Necrosis

Damage of a zone of segment of liver tissue



Necrosis

Damage of a few scattered hepatocytes

Viral hepatitis

Liver diseases

Viral hepatitis

Definition: Inflammation of liver tissue caused by viral infection

Etiology:

1. Infection by hepatitis virus that **involve only liver:**

A. Hepatitis A virus (HAV).

B. Hepatitis B virus (HBV).

C. Hepatitis C virus (HCV).

D. Hepatitis delta virus (HDV).

E. Hepatitis E virus (HEV).

2- Infection by other viruses as infectious mononucleosis and CMV; as a part of systemic viral infection

Liver diseases

Viral hepatitis

Mode of transmission and incubation period

1. Feco-oral transmission (ingestion of contaminated water and food): occurs in HAV and HEV
2. Parenteral. Occurs in HBV, HCV and HDV. Examples are:
 - Blood transfusions
 - Use of contaminated syringes.
 - From mother to child

Liver diseases

Viral hepatitis

Mode of transmission and incubation period

<u>Virus</u>	<u>Transmission</u>	<u>Incubation Period*</u>
A	fecal-oral	4 (2-6)
B	parenteral	8-12 (6-24)
C	parenteral	6-9 (2-24)
D	parenteral	? (2-10)
E	fecal-oral	4-5 (2-9)

Liver diseases

Viral hepatitis

Clinical forms:

- 1. Acute hepatitis:** can occur in HAV, HBV, HEV and HDV infection
- 2. Fulminant hepatitis:** can occur in HBV, HDV
- 3. Chronic hepatitis:** occurs mainly in HBV and HCV
- 4. Carrier;** *NO clinical presentation*

Liver diseases

Viral hepatitis

Clinical forms:

- 1. *Acute viral hepatitis:*** Acute infection characterized by diffuse hepatitis with liver cell necrosis.
- 2. *Fulminant hepatitis:*** a severe acute form of hepatitis associated with widespread liver necrosis and acute liver cell failure
- 3. *Chronic hepatitis:*** a chronic condition characterized by gradual progressive destruction of hepatocytes leading to regeneration nodules and usually ends by liver cirrhosis
- 4. *Carrier;*** *NO clinical presentation*

Liver diseases

Viral hepatitis

Clinical forms:

Acute

- Incubation = several weeks
- “Flu-like” symptoms, fever, myalgias, pharyngitis
- Jaundice, enlarged, painful liver
- Marked elevations in LFTs
- Resolves spontaneously

Chronic

- Often asymptomatic
- Physical exam can show signs of portal hypertension or liver inflammation
- LFTs can be normal or elevated
- Persists for years or decades

LFTs: liver function tests

↑↑
A & E cause acute hepatitis

↑↑ ↑↑
B can cause both

↑↑
C causes chronic hepatitis

Liver diseases

Viral hepatitis

Pathological features

1- Acute hepatitis:

Gross: Slightly enlarged liver.

Microscopic:

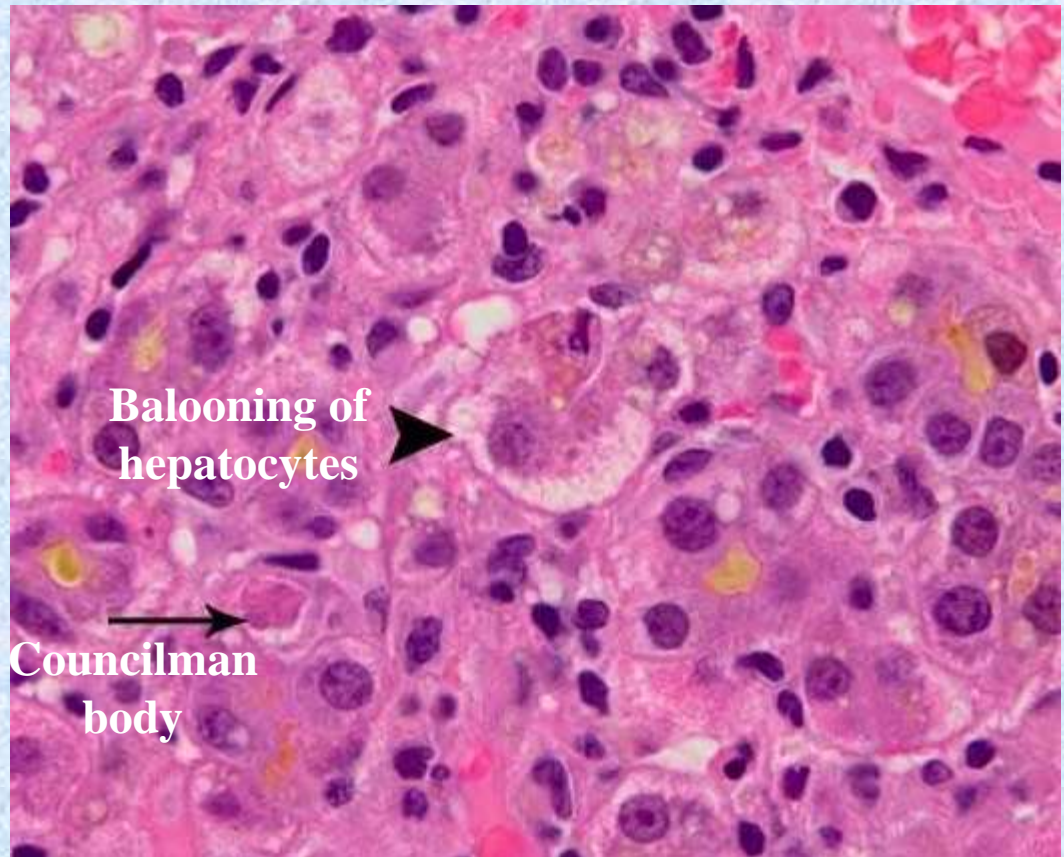
1. Hydropic (ballooning) swelling of the hepatocytes.
2. Focal necrosis of hepatocytes (Councilman bodies).
4. Infiltration of portal areas with by lymphocytes and macrophages.
5. Bile retention (Cholestasis)

Liver diseases

Viral hepatitis

Pathological features

1- Acute hepatitis:



Liver diseases

Viral hepatitis

Pathological features

1- Chronic hepatitis:

Gross: Slightly enlarged or normal-sized liver.

Microscopic:

1. Infiltration of portal tracts and hepatic lobules by inflammatory cells mainly lymphocytes that form lymphoid aggregates
2. Piecemeal necrosis: focal necrosis of hepatocytes at the limiting plate of hepatic lobule
3. Scattered apoptosis of hepatocytes
4. Liver architecture is preserved

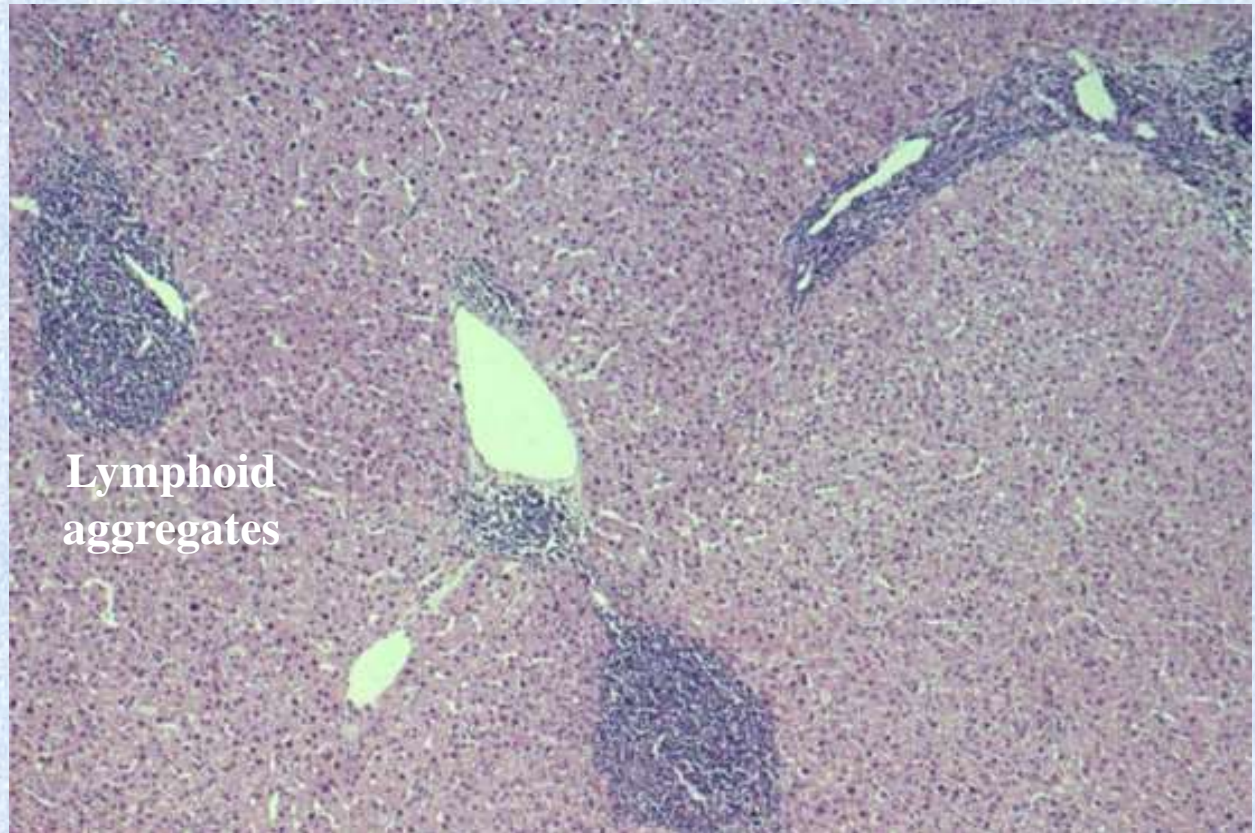
Liver diseases

Viral hepatitis

Pathological features

1- Chronic hepatitis:

Microscopic:



Liver diseases

Viral hepatitis

Fate of viral hepatitis

Fate of acute hepatitis

1. Complete recovery in majority if cases specially HAV infection.
2. Carrier state.
3. Failure of recovery with progress of the disease to:
 - (a) ***Fulminant hepatitis***: It is a fatal condition due to massive liver cell necrosis.
 - (b) **Progression to chronic hepatitis**

Fate of chronic hepatitis: usually progress to liver cirrhosis

Liver diseases

Viral hepatitis

Complications

Common complications

- ◆ **ACUTE:**
- ◆ Fulminant hepatitis with confluent necrosis- HAV, HBV, HDV, HEV
- ◆ Chronic hepatitis-HAV
- ◆ **CHRONIC:**
- ◆ Scarring of the liver (**cirrhosis**)(HBV, HCV,HDV)
- ◆ Liver cancer.
- ◆ Liver failure.

Liver cirrhosis

Liver diseases

Liver cirrhosis

Definition

A Chronic diffuse irreversible liver disease characterized by:

- a. Degeneration and necrosis of the liver cells.
- b. Regeneration forming nodules
- c. Loss of normal lobular pattern.
- d. Diffuse fibrosis.

Liver diseases

Liver cirrhosis

Etiology

1. Post-hepatitis cirrhosis: follow hepatitis B, hepatitis C and hepatitis D infection
2. Alcoholic cirrhosis (nutritional or Laennec's) chronic consumption of alcohol
3. Biliary cirrhosis; due to obstruction of bile pathway
4. Cardiac cirrhosis: due to chronic venous congestion of liver
5. Metabolic diseases as hemochromatosis, Wilson's disease and alpha-1-antitrypsin deficiency.

Liver diseases

Liver cirrhosis

Pathological features

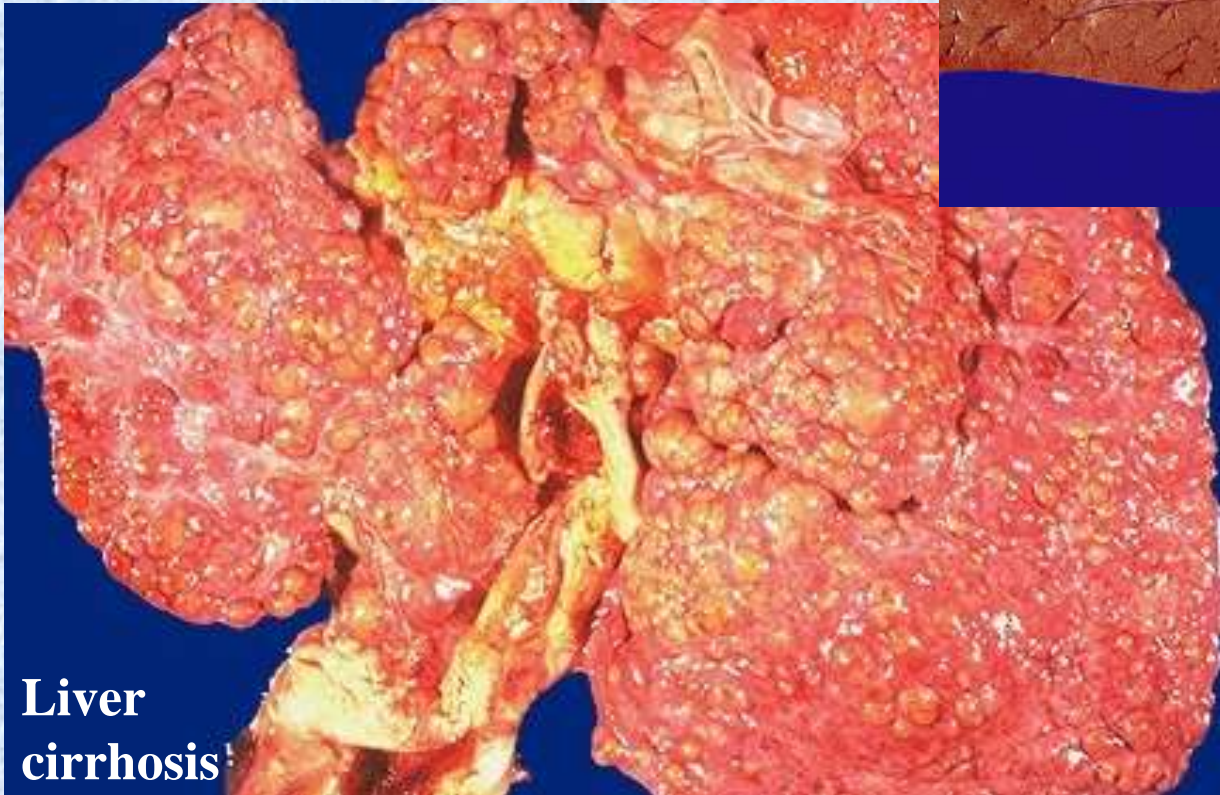
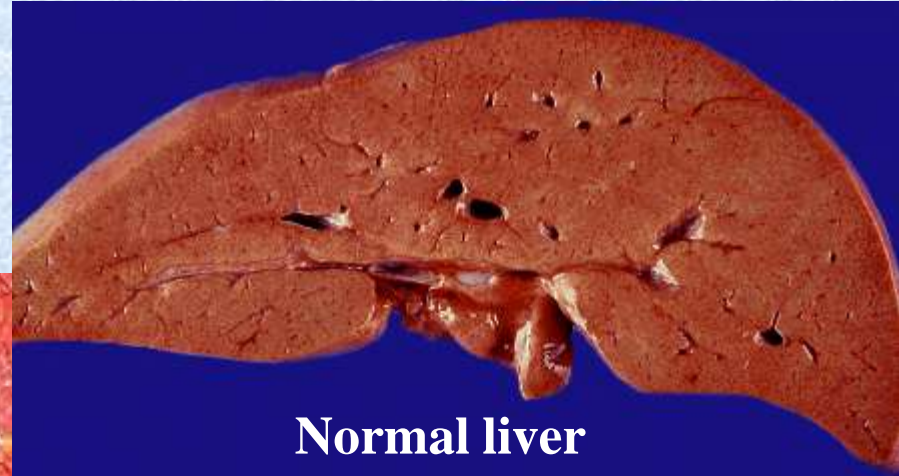
Grossly

1. The liver is reduced in size.
2. Firm in consistency due to fibrosis.
3. Outer surface is diffusely nodular
4. The capsule is thickened.
5. Cut section: multiple variable sized nodules separated by white fibrous septa.

Liver diseases

Liver cirrhosis

Pathological features
Grossly



Liver diseases

Liver cirrhosis

Pathological features

Microscopic

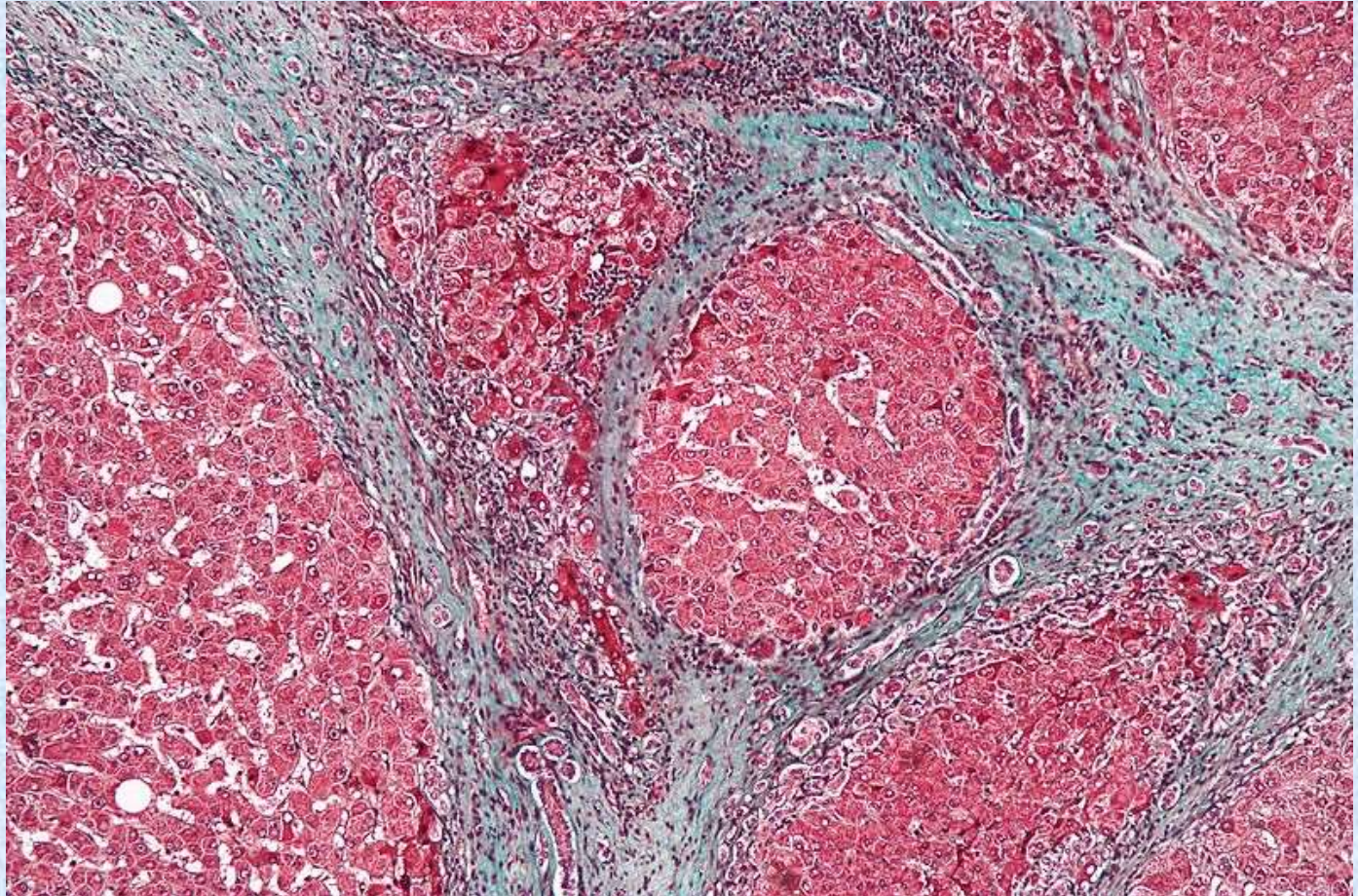
1. The liver shows complete loss of the normal lobular pattern.
2. The liver is formed of regenerating nodules: variable in size and shape
3. The nodules are separated by fibrous tissue septa.

Liver diseases

Liver cirrhosis

Pathological features

Microscopic



Liver diseases

Liver cirrhosis

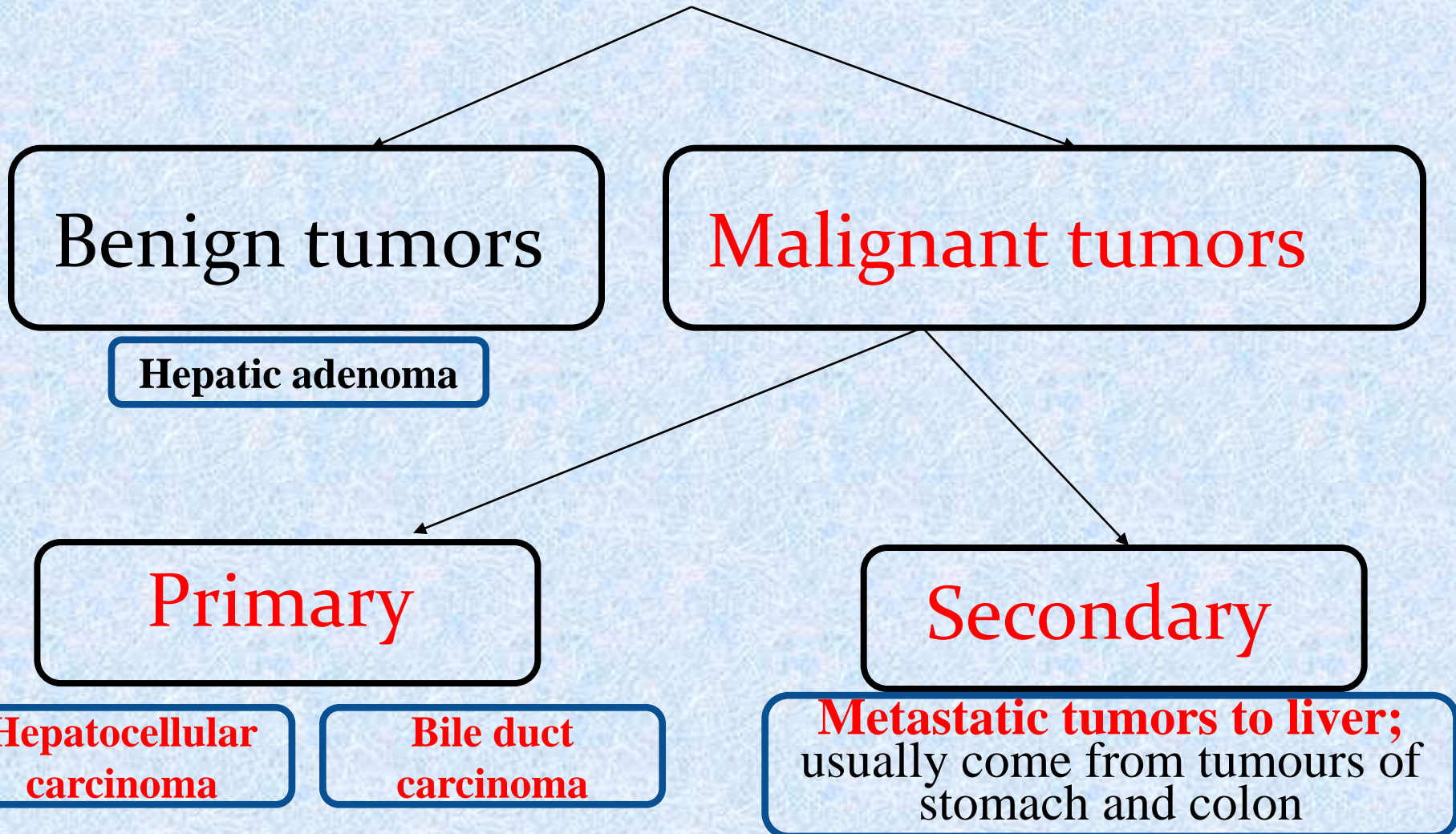
Complications

1. Portal hypertension and esophageal varices (it is the most common cause of death in cases of liver cirrhosis)
2. Ascites
3. Hypersplenism
4. Impaired liver function
5. Malignancy (hepatocellular carcinoma)

Tumors of the Liver

Liver diseases

Tumors of the liver



Benign tumors

Hepatic adenoma

Malignant tumors

Primary

Hepatocellular carcinoma

Bile duct carcinoma

Secondary

Metastatic tumors to liver; usually come from tumours of stomach and colon

Liver diseases

Tumors of the liver

Hepatocellular carcinoma

- ❑ It is the commonest primary tumor of the liver
- ❑ Common in Egypt
- ❑ Usually affect old age (between 40-60 years).
- ❑ The predisposing factors are:
 1. Chronic hepatitis B and C.
 2. Liver cirrhosis.
 3. Aflatoxin material

Liver diseases

Tumors of the liver

Hepatocellular carcinoma

□ Grossly

- The liver is enlarged and nodular.
- Cut section shows a single large bulky mass or multiple small nodules scattered throughout the liver.
- The cut surface of the tumor shows necrosis, hemorrhage and bile staining.

Liver diseases

Tumors of the liver

Hepatocellular carcinoma

□ Grossly



Liver diseases

Tumors of the liver

Hepatocellular carcinoma

□ Microscopic

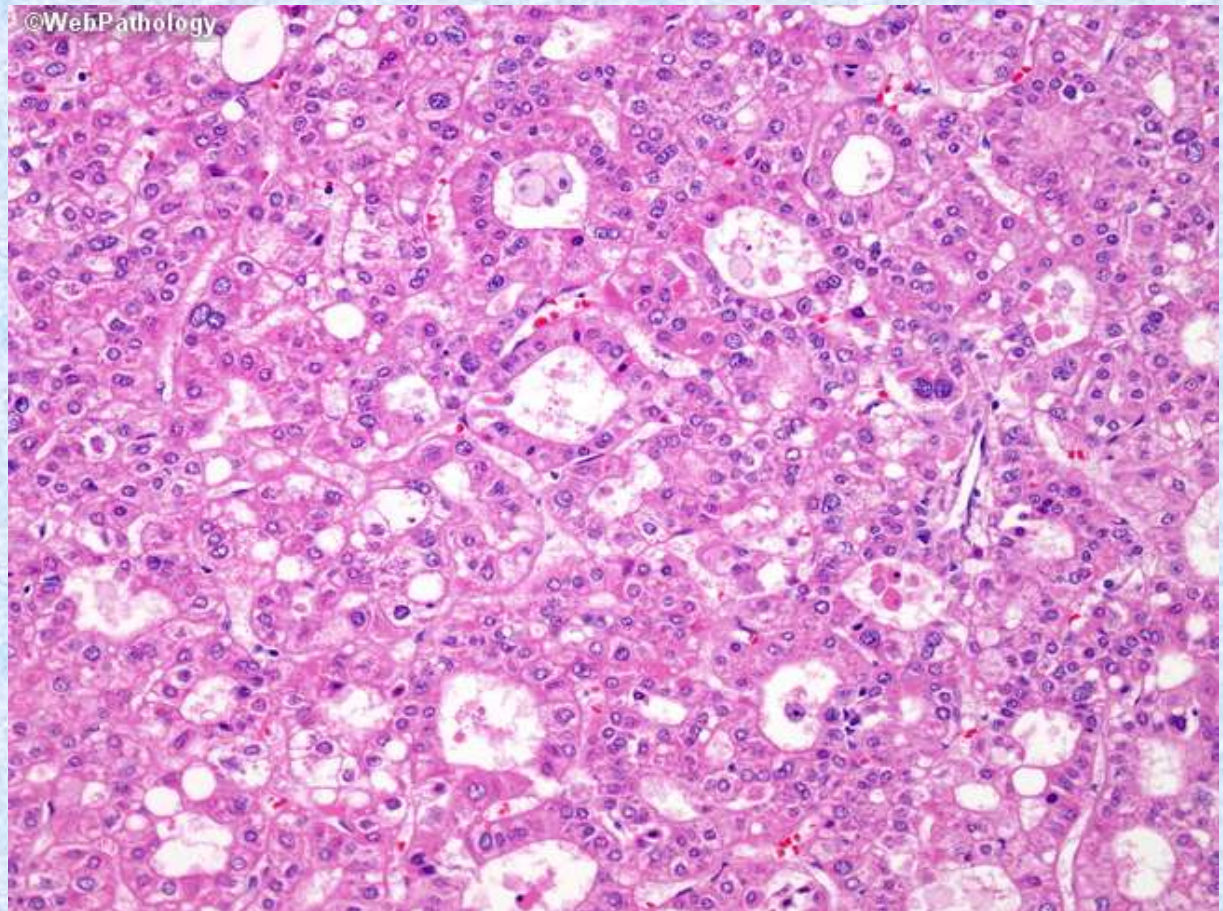
- The tumor consists of large polyhedral cells resembling liver cells forming cords of acini
- The cells vary in size and shape with hyperchromatic nuclei, many mitosis.
- The stroma is scanty and vascular.

Liver diseases

Tumors of the liver

Hepatocellular carcinoma

- Microscopic



Liver diseases

Tumors of the liver

Hepatocellular carcinoma

□ Spread

1. Direct spread to adjacent tissue
2. Lymphatic spread to portal and para-aortic lymph nodes.
3. Blood spread to lungs and bones.

Thank you