

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Basic Histopathological Diagnosis (MLS-HIST-421)
Histopathology and cytology department
Pathology department

Lec 39

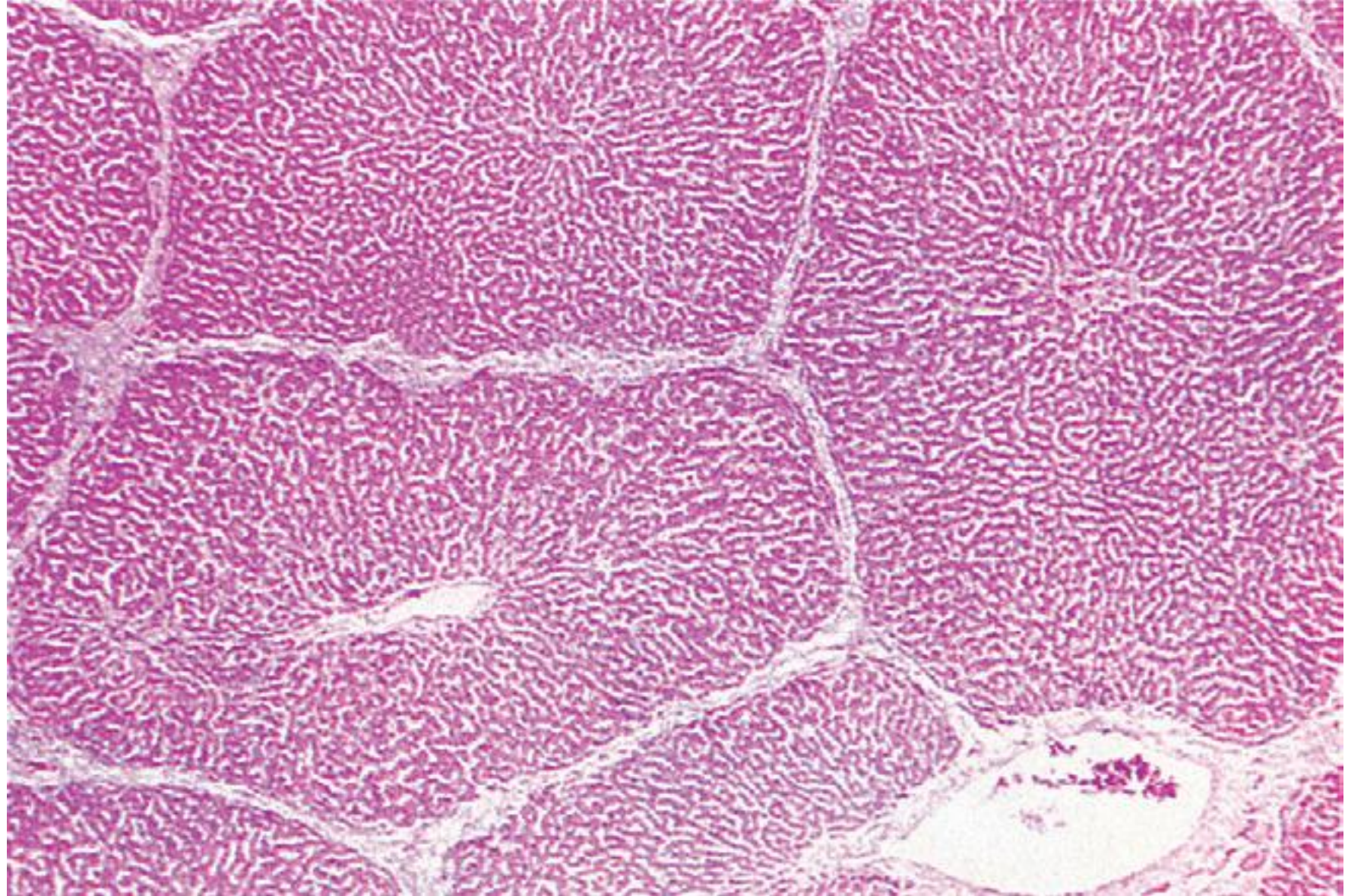
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Objectives:

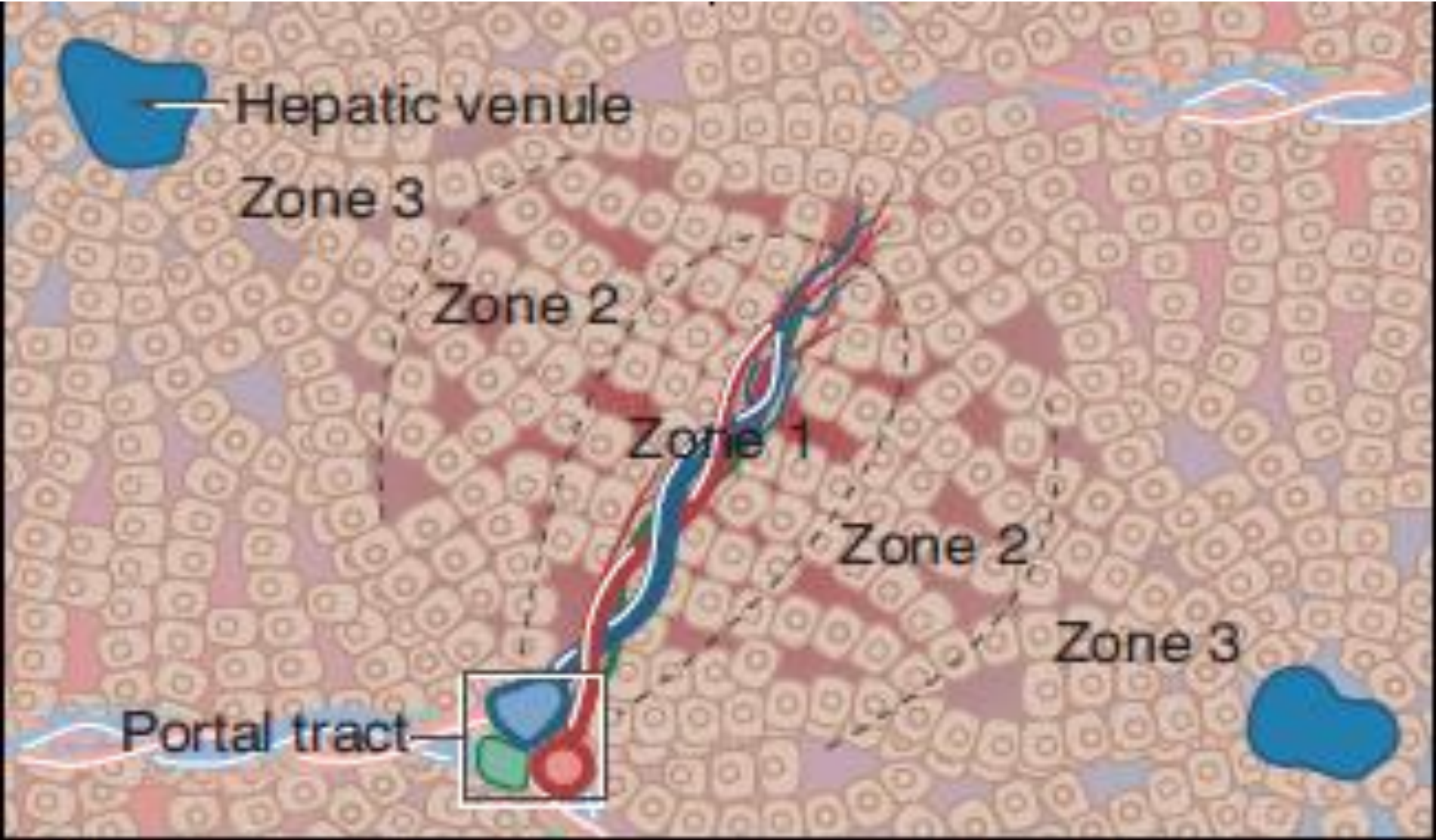
- By the end of this lecture you will be able to :
- Define hepatitis .
- classify hepatitis .
- Discuss morphological features of each type.

Introduction

- Normal structure of liver:



Zones of the liver



Hepatic zones

- Division of liver to zones depends on its O₂ and nutrient supply.
- **Zone I:** close to portal tract.
- Has high nutrient and oxygen supply, but more susceptible to toxins.
- **Zone III:** near to portal vein.
- First area to be affected in ischemic injury and fatty changes.
- Last area to be affected by toxins.

Introduction

Hepatitis is the inflammation of liver.

Can be acute, fulminant , chronic.

- Acute and chronic hepatitis are distinguished by:
 - I. Duration:
 - II. The pattern of cell injury:

Etiology

A- Infectious hepatitis:

- Viral hepatitis:
 - Hepatotrophic viruses: HAV, HBV, HCV....
 - Non hepatotropic viruses: CMV, EBV,
- Bacteria: Mycobacterium.
- Protozoa: hydatid cyst, E. histolytica, schistosomiasis.

Etiology

B. Autoimmune hepatitis.

C. Toxic exposure (alcohol and drugs).

D. Metabolic diseases: Wilson's disease, hemochromatosis.

Viral Hepatitis

- Most common cause of hepatitis.
- Classified according to causative agent: A, B, C, D, E, F, G...

Morphology

- **Macroscopy:**
- **Enlarged liver.**
- **Tense capsule**
- Mild acute hepatitis: Spotted liver.
- Severe form: extensive necrosis → shrinkage.
- If there is cholestasis liver is yellow.
- Inadequate regeneration: nodular surface.

microscopy

1- inflammatory cells: In acute hepatitis and chronic viral hepatitis are mainly **lymphocytes**.

- Because it result from host immune response to viral ag expressed on surface of hepatocytes and not due to classical acute inflammation cellular and vascular reaction.

2- Hepatocytes injury: Ballooning. Fatty changes.

Microscopy

3- Hepatocyte necrosis:

- Single cells necrosis: councilman.
- Bridging necrosis:
- Pan acinar necrosis.

4- hepatocytes proliferation.

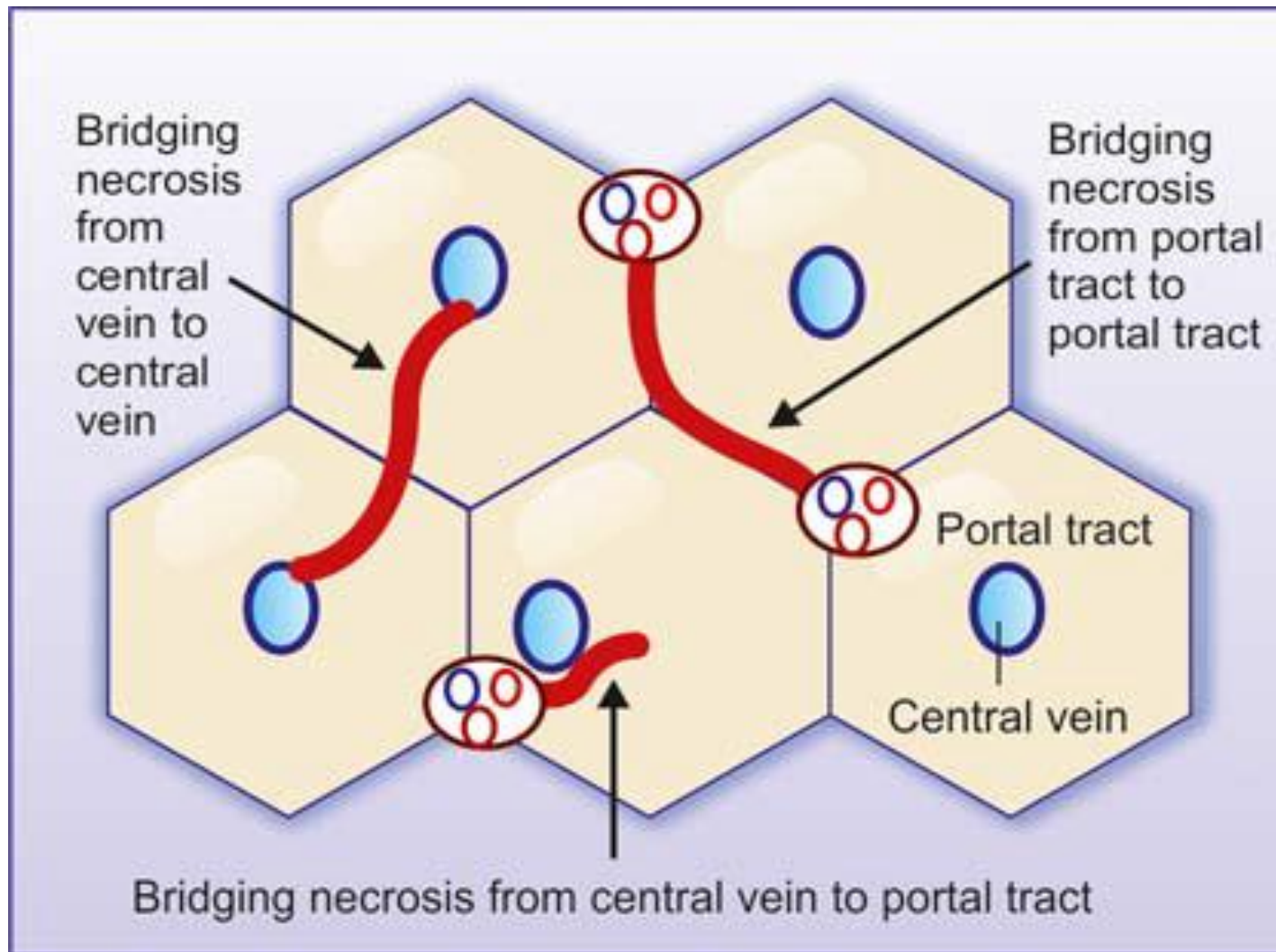
Microscopic features continue

5- Sinusoidal cell (Kupffer cells) reactive changes.

6. Lobular disorganization.

**7- Interphase hepatitis—inflammation spill over to adjacent
parenchyma**

Morphology of acute hepatitis



Chronic hepatitis

- Occurs when hepatic inflammation persistent more than 6 months.

morphology

- a. **Hepatocyte injury, apoptosis.**
- b. **Hepatocytes regeneration.**
- c. **Portal tract inflammation and interphase hepatitis.**
- d. **Bridging inflammation and necrosis.**
- e. Fibrous collagen deposition in portal tracts.
- f. Later bridging fibrosis (p-p, c-c, p-c).
- g. At last—end stage cirrhosis.

HBV

- Partially double-stranded circular DNA virus.
- **Pathogenesis:**
- The virus is transmitted by parenteral route, → in hepatocytes it is not incorporated in hepatocytes DNA but multiply using RNA polymerase.
- Virus is not cytotoxic to hepatocytes
- It evades the innate immune response.
- But it induces adaptive immune response which is responsible for hepatocytes necrosis.

HCV

- Single stranded RNA.
- 6 subtypes are identified, different subtypes can infect the same person.
- Transmitted by parenteral route.
- High tendency, for chronic infection, liver cirrhosis and hepatocellular carcinoma.

Autoimmune Hepatitis

- Caused by liver-specific autoantibodies
- Associated with other autoimmune diseases: Rheumatoid arthritis, Thyroiditis Sjogren syndrome, Ulcerative colitis
- Associated with HLA-B8 and HLA-DRw3
- most of the patients are female

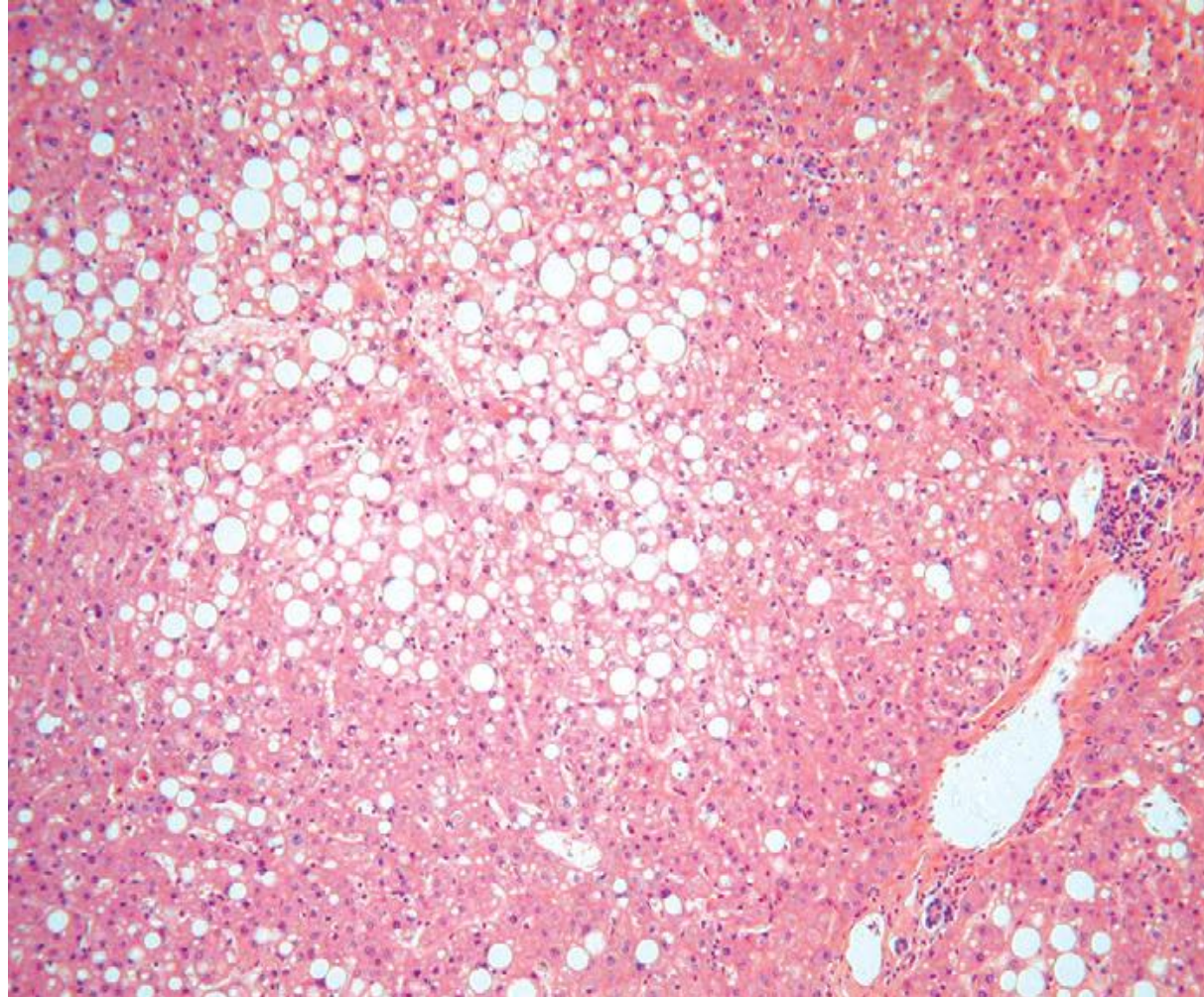
Autoimmune hepatitis

- Of two types:
- Type I;
- Occur in adults. Female predominant.
- Antinuclear antibodies (ANA),
- Type II:
- Occur in children.
- Anti-Liver and Kidney Microsome antibodies (LKM)
- Treatment: immunosuppression.

Fatty liver



Fatty liver



Alcoholic hepatitis

- Pathogenesis: Not well understood. But the following are supposed:
- Ethanol is toxic to cytoskeleton organelles and impair membrane function.
- Metabolites products of ethanol are cytotoxic to hepatocytes.
- ROS: Produced during oxidation of alcohol , or by infiltrating neutrophils causes hepatocytes damage.
- Cytokines mediate cell damage.

Morphology

- 1- Hepatocellular ballooning and necrosis mainly in central zone.
- 2- Cytoplasmic hyaline inclusion → **Mallory Denk bodies. M-D bodies**
- 3- Acute inflammatory infiltrate , particularly around cells with M-D bodies
→ Satellitosis

Morphology

4- In some cases of severe alcoholic hepatitis, florid neutrophilic infiltration in perivenular regions associated with confluent hepatocyte necrosis and fibrous obliteration of perivenular sinusoids → ***central sclerosing hyaline necrosis.***

- EM: features of organelles damages e.g. giant mitochondria