V.I. Vernadsky Crimea Federal University
Medical Academy named after S.I. Geogievsky

LIVER DISEASES

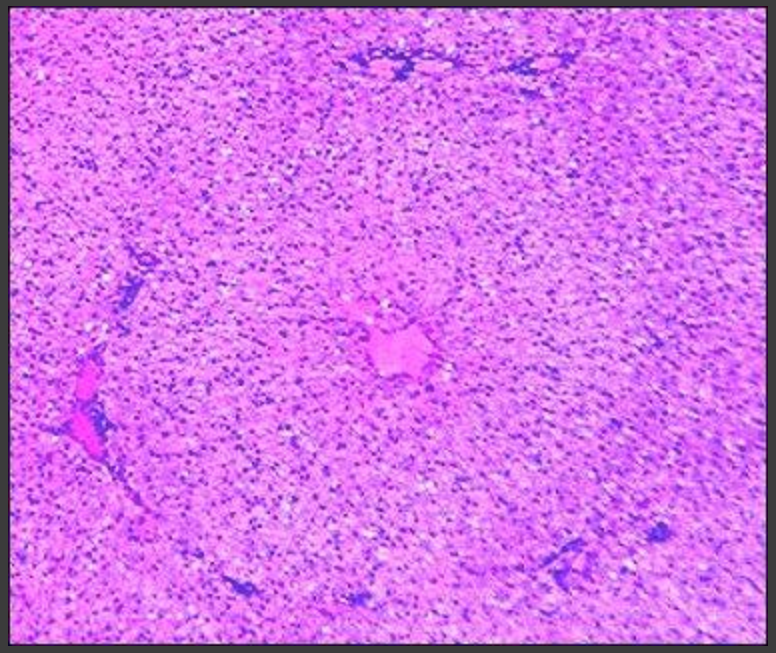
International Medical Faculty
Pathological Anatomy Department

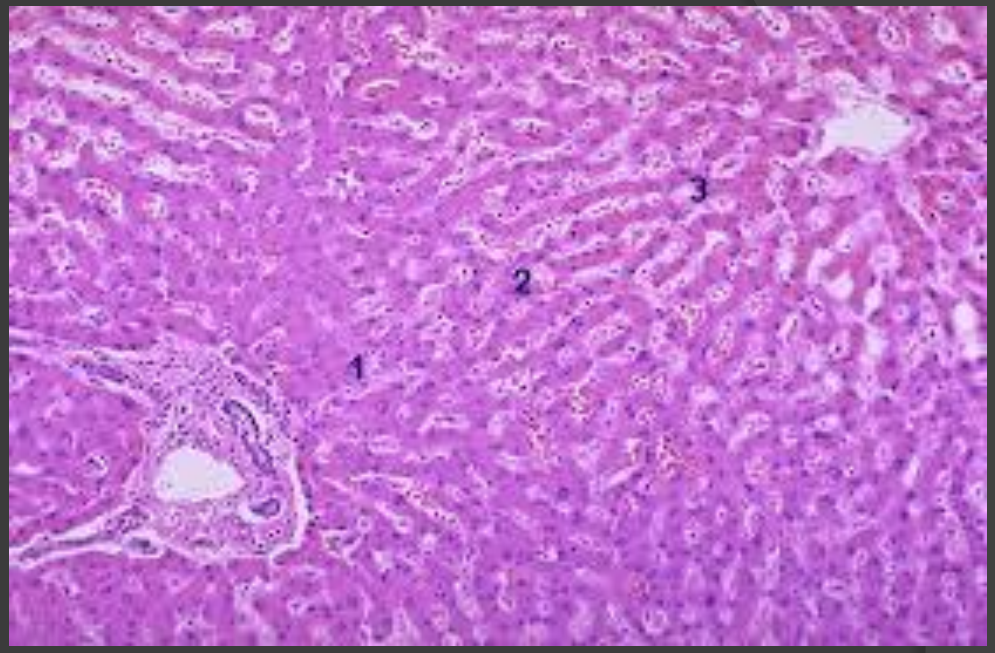
Lecturer - Kriventsov M.A.

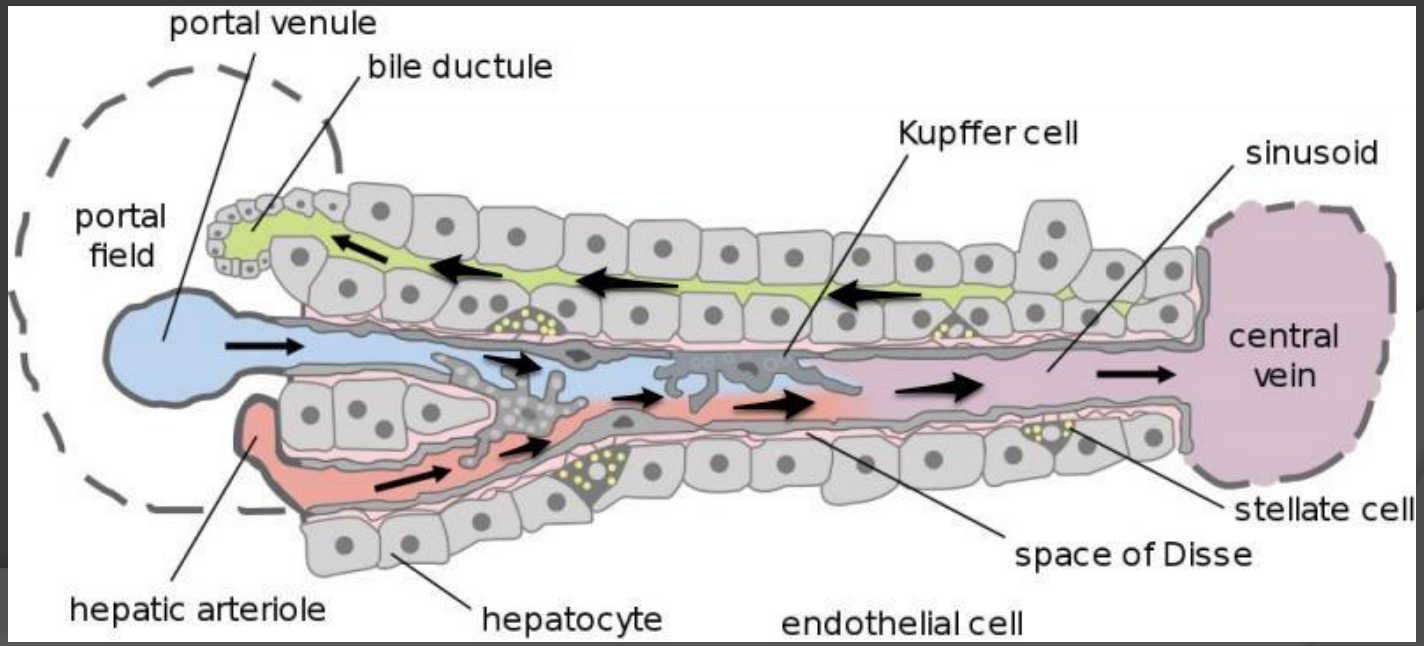
PLAN OF THE LECTURE

- Classification of liver diseases, their ethiology and pathogenesis
- Hepatoses: definition, ethiology, pathogenesis, pathological anatomy, complications and outcomes
- Hepatitis: definition, ethiology, pathogenesis, pathological anatomy, complications and outcomes
- Liver cirrosis : definition, ethiology, pathogenesis, pathological anatomy, complications and outcomes
- Causes of death

HEPATIC LOBULE

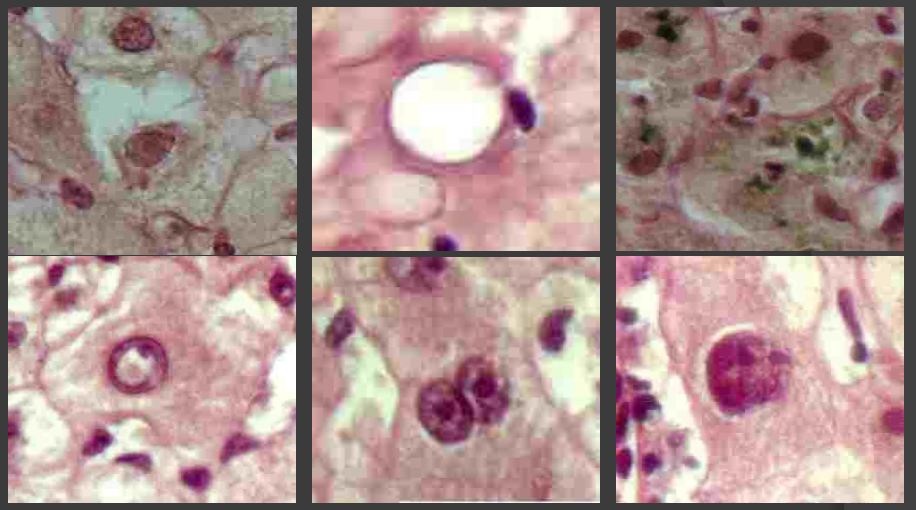




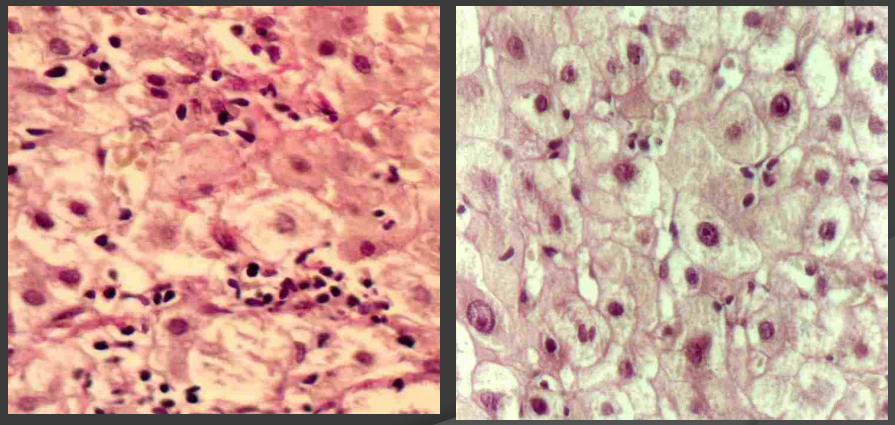


Pathomorphological changes in liver

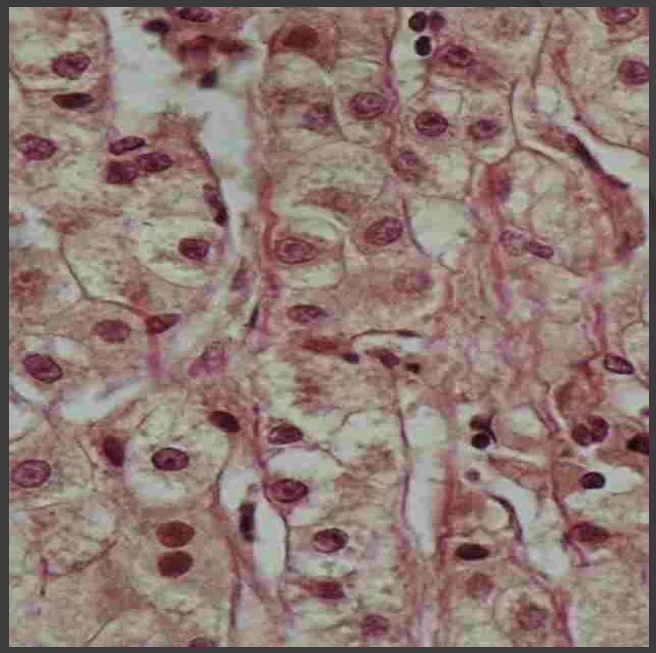
1. Hepatocytes changes



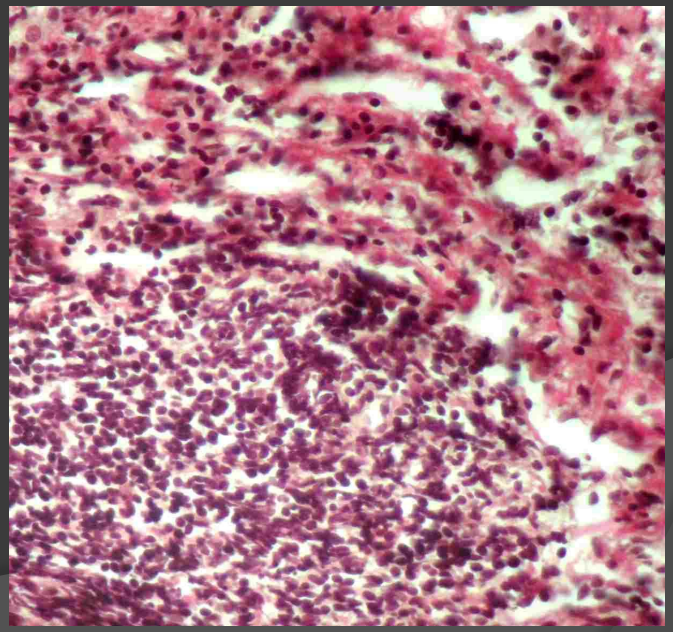
2. Activation of sinusoid cells



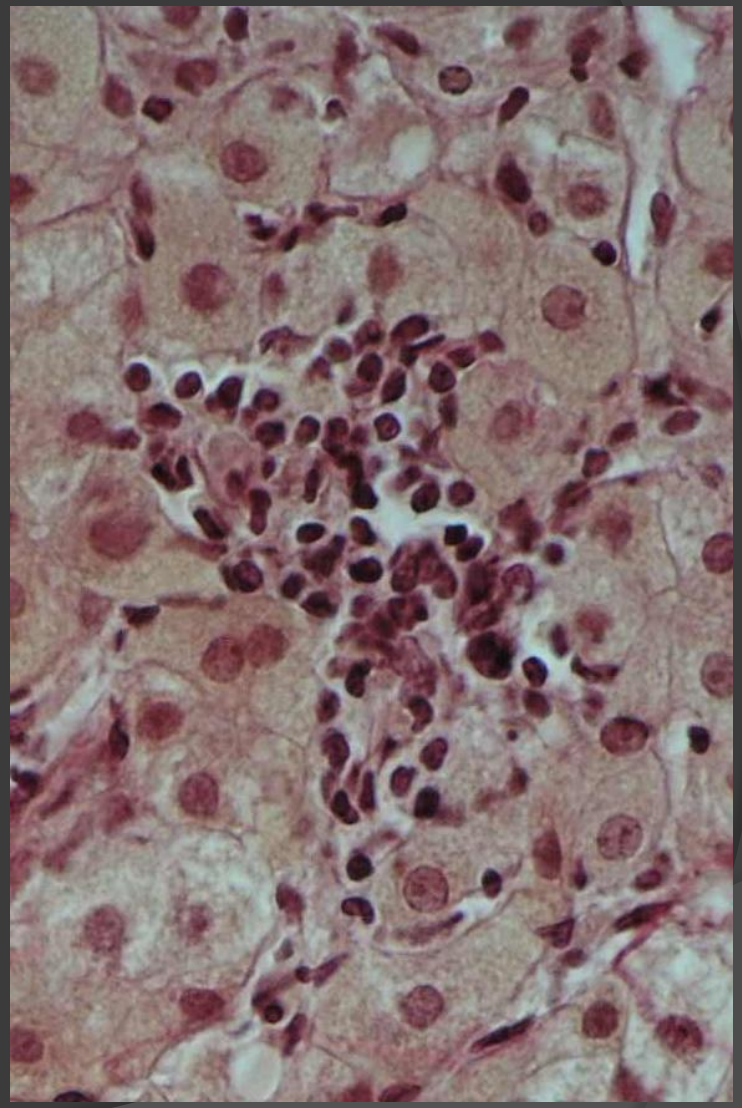
3. Disse space (staining van Gison)



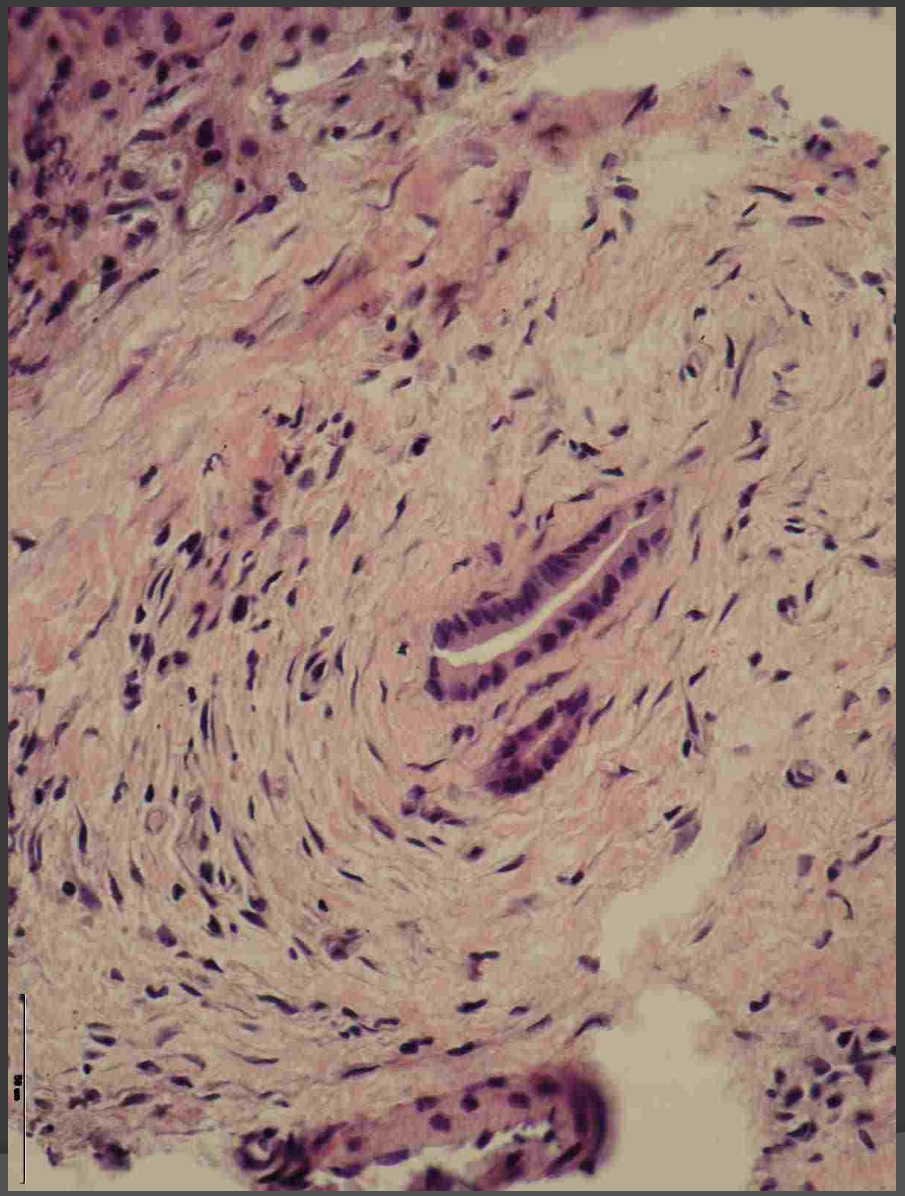
4. Inflammatory infiltration of portal tracts (possible formation of lymphoid follicles)

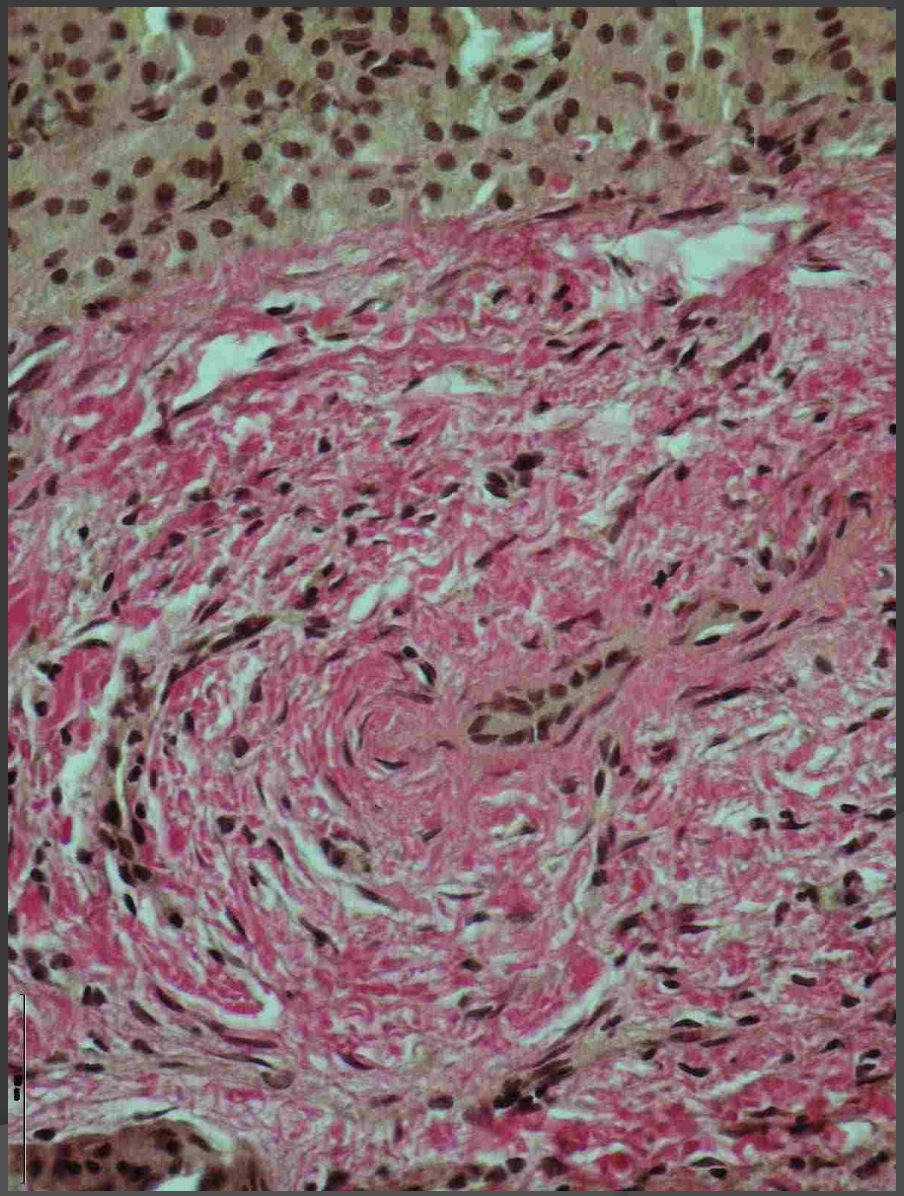


5. Immune damage of hepatocytes



6. Changes in bile ducts





CLASSIFICATION OF LIVER DISEASES

- Congenital abnormalies
- Hepatoses (lipid, pigment, etc.)
- Hepatitis (alcoholic, viral, etc.)
- Liver cirrhosis
- Hepatic tumors

HEPATOSES

- **Hepatosis is a disease of the liver with dystrophy and necrosis of hepatocytes**

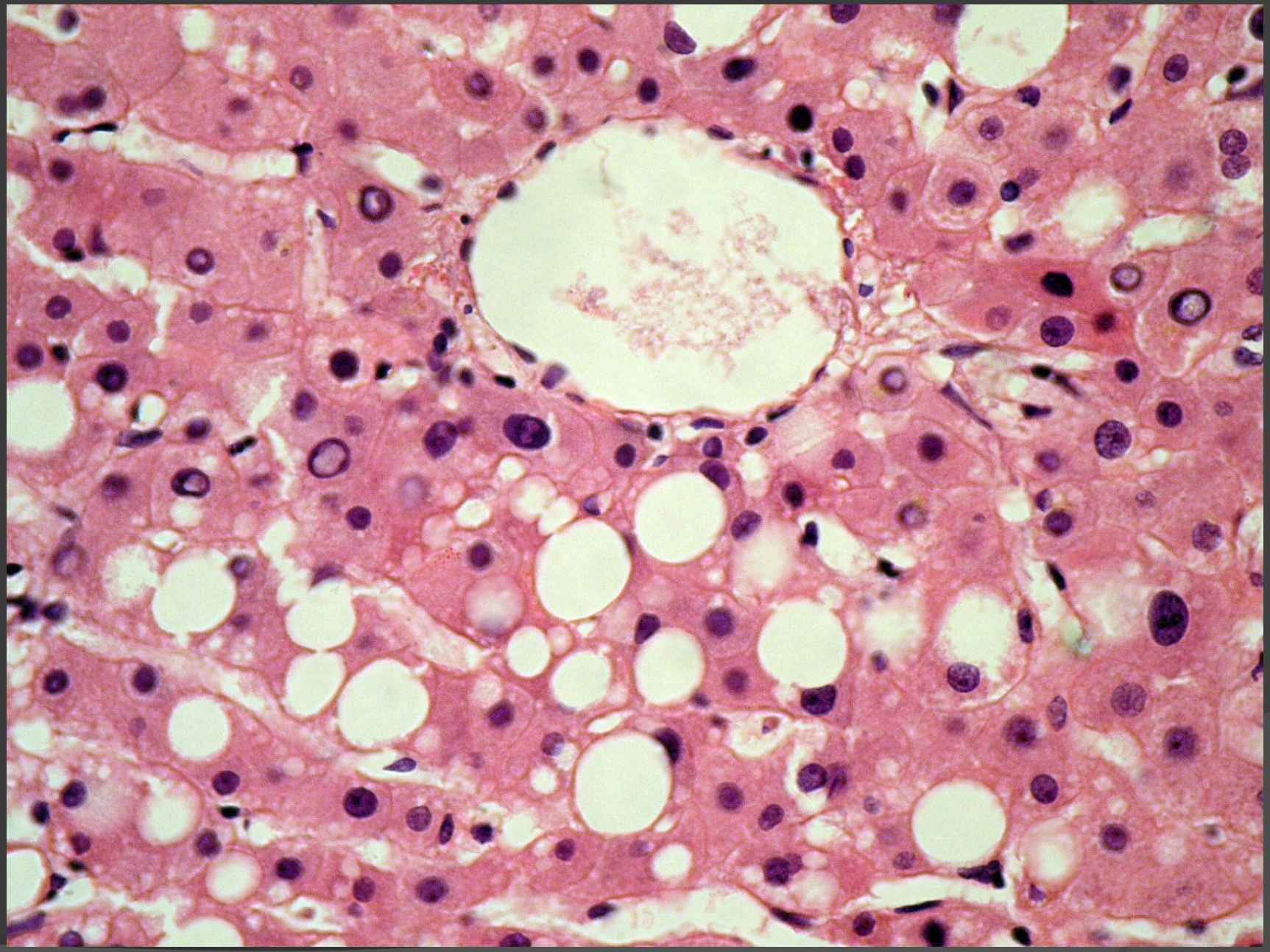
1. Poisoning (phosphorus, arsenic, alcohol, drugs, mushrooms, food)
2. Hepatitis
3. Sepsis
4. Hereditary metabolic disorders
5. Hypoxia in cardio-pulmonary pathology

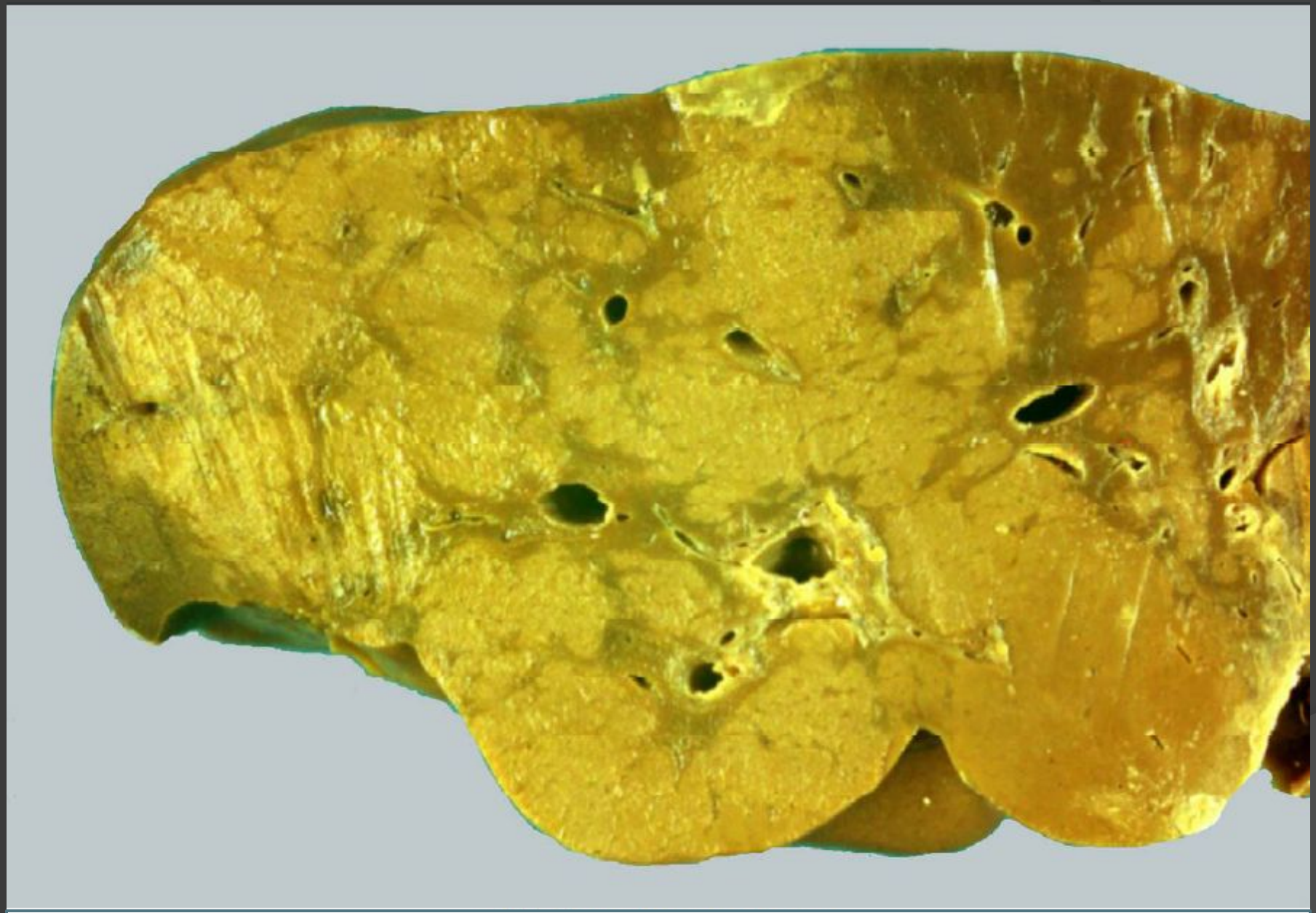
Nonalcoholic fatty liver disease
Alcoholic liver disease **IDC10**
Other toxic liver diseases

HEPATOSES

STAGE OF YELLOW DYSTROPHY

- *Macroscopic*: **liver is enlarged, compact or loose, bright yellow color. Then it decreases, becomes flabby with wrinkled capsule; liver tissue section is gray to yellow.**
- *Microscopic:* **fatty degeneration of hepatocytes in centers of lobules, quickly changing into necrosis and formation of fat and protein detritus.**

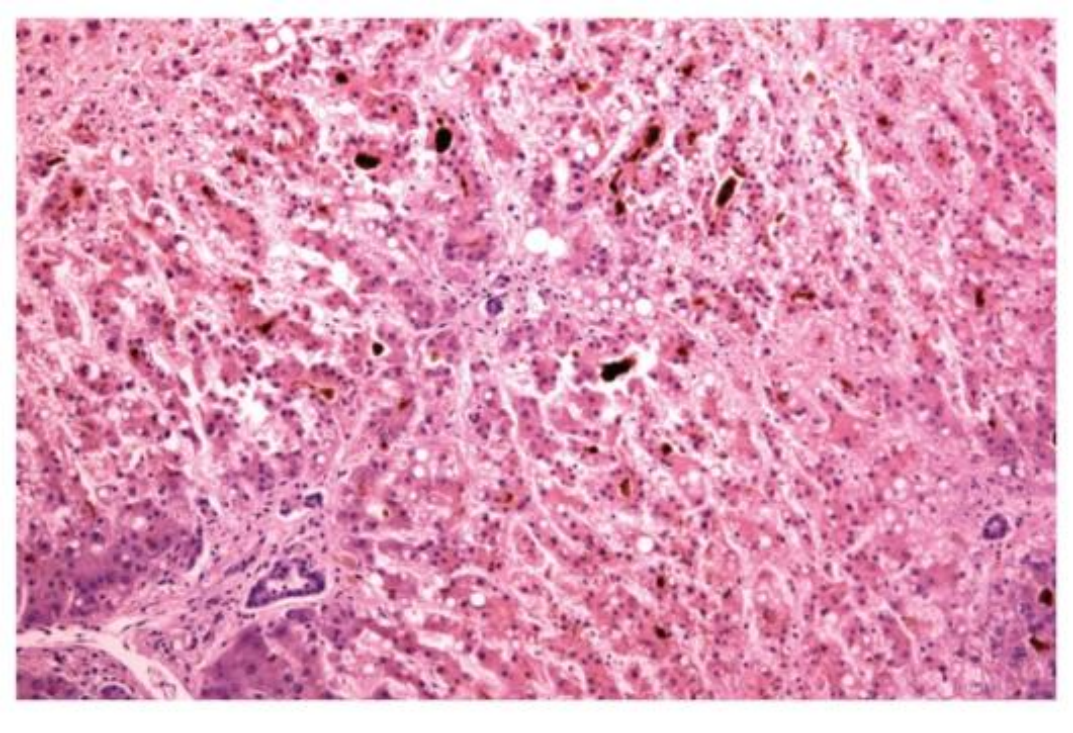




HEPATOSES

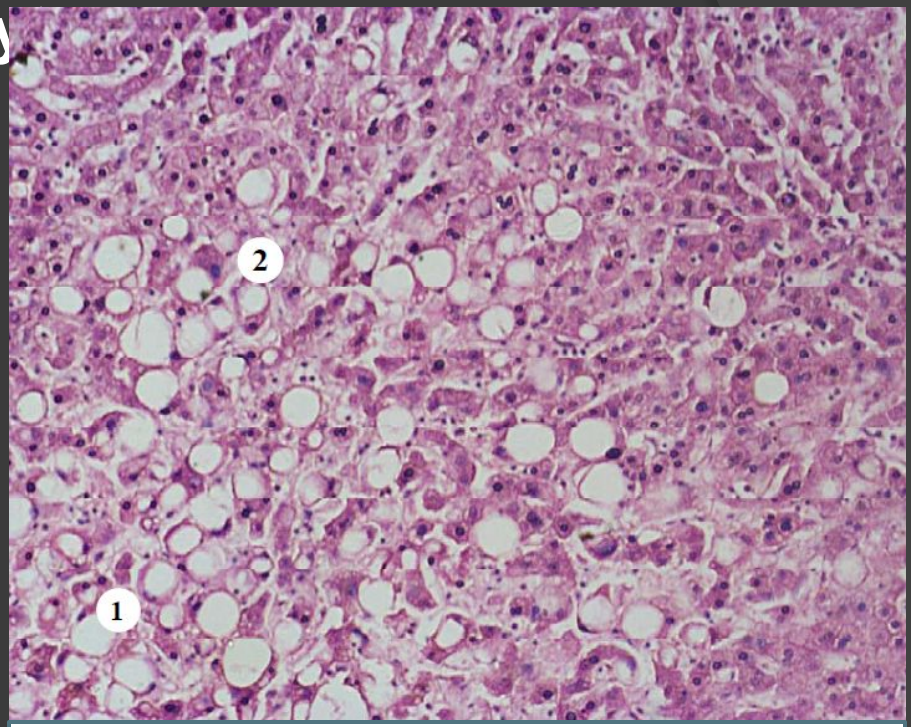
STAGE OF RED DYSTROPHY

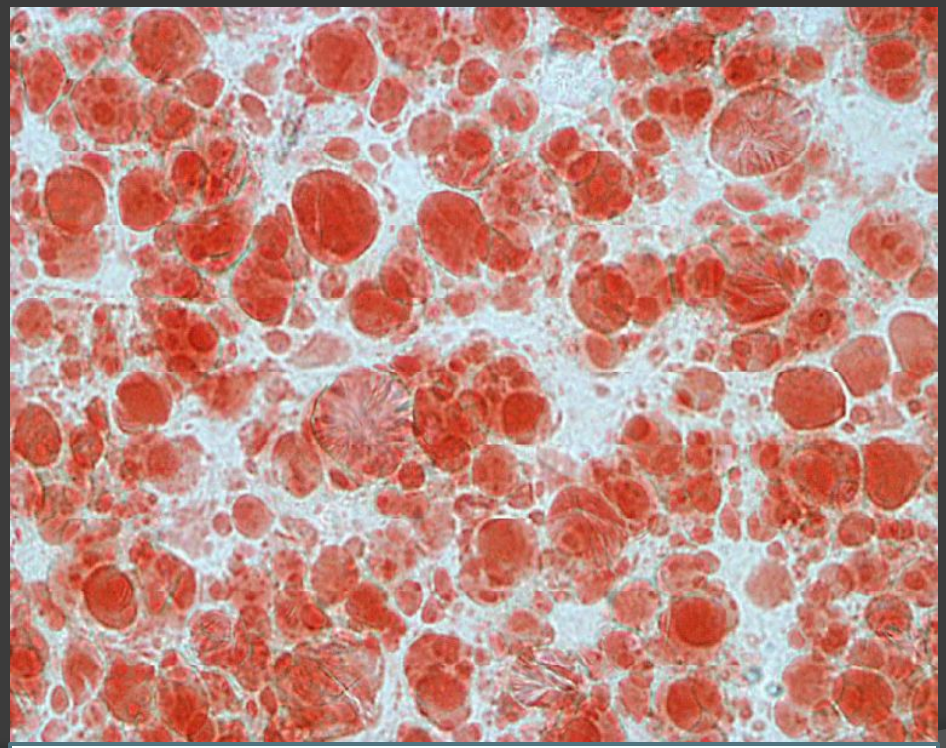
- Liver continues to decrease and becomes red. Necrosis in all parts of the lobule; only at the periphery is a narrow strip of hepatocytes in a state of fatty degeneration.



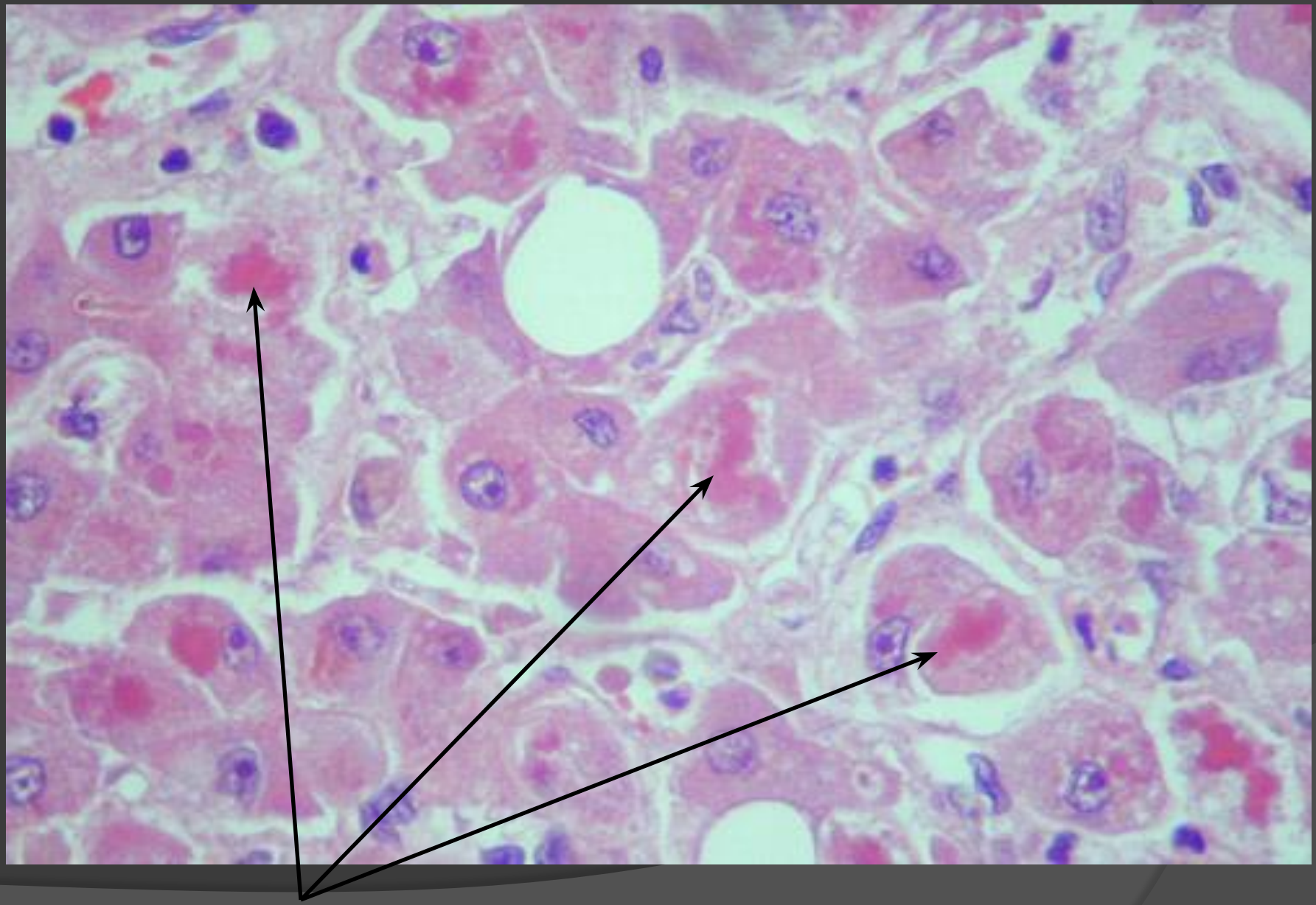
HEPATOSES

- **FATTY LIVER (STEATOSIS)**
  Fatty dystrophy of hepatocy
  - powdered
  - small drops
  - large drops



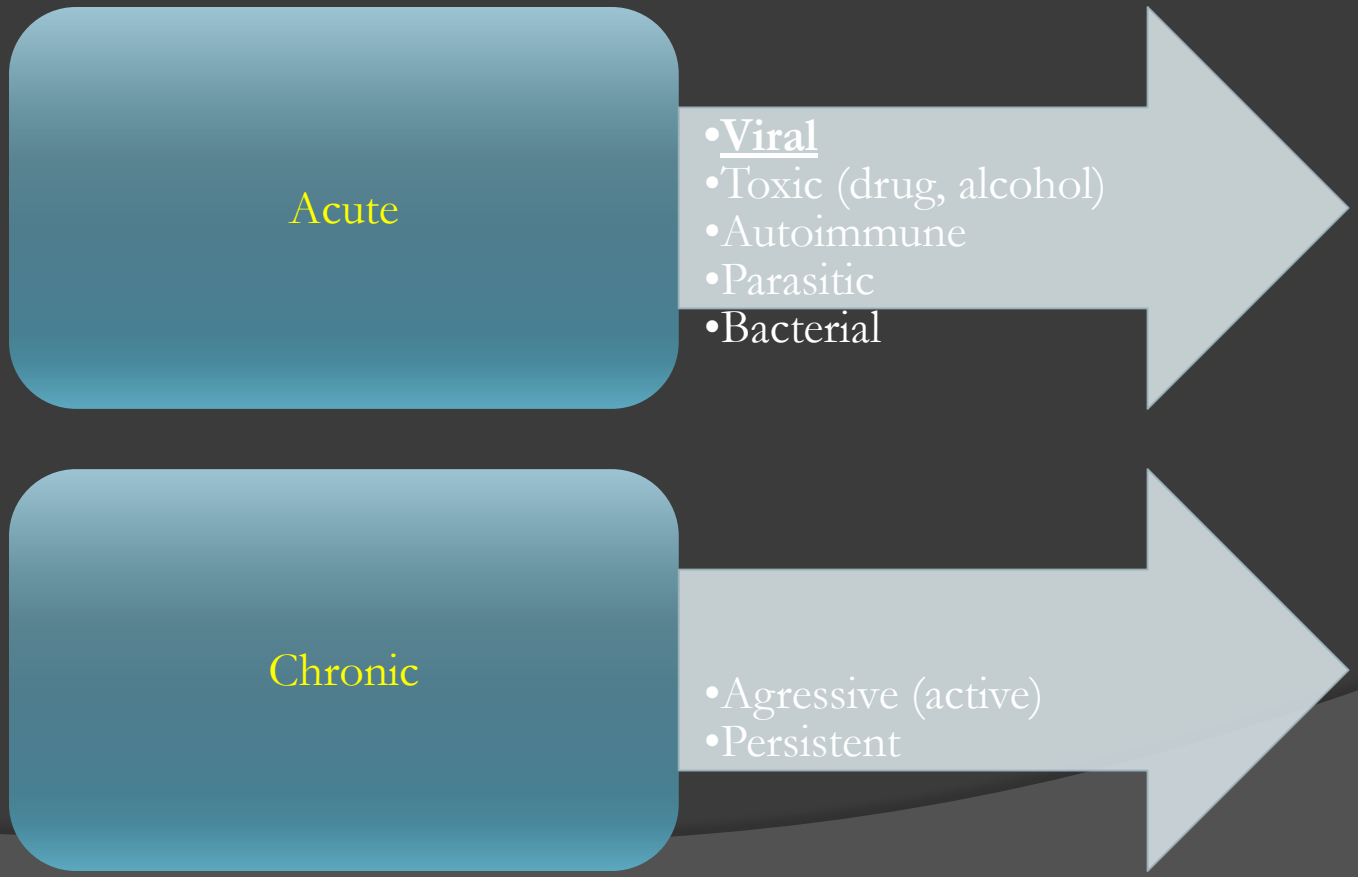


HEPATOSES



HEPATITIS

- **Hepatitis is a common name for acute or chronic diffuse inflammatory diseases of the liver with various ethiology.**



HEPATITIS

Virus	Course	Way to be infected	Chronic
Hepatitis A	RNA	Fecal-oral	-
Hepatitis B	DNA	Parenteral, perinatal, sexual	+
Hepatitis C	RNA	Parenteral, sexual	+
Hepatitis D	RNA	Parenteral (superinfection)	+
Hepatitis E	RNA	Fecal-oral	-
Hepatitis F	RNA	Parenteral	-
Hepatitis G	RNA	Parenteral	?

HEPATITIS

Virus	Course	Way to be infected	Chronic
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Hepatitis E	RNA	Fecal-oral	-
Hepatitis F	RNA	Parenteral	-
Hepatitis G	RNA	Parenteral	?

+ Herpes simplex virus, yellow fever virus, cytomegalovirus, measles virus, etc.

HEPATITIS

PATHOGENESIS

Damage of the hepatic cells by hepatotropic viruses is based on two possible mechanisms:

- Direct **cytopathic effect** of viruses;
- **Induction of the immune response** againts viral antigens or antigens of virus-infected hepatocytes

HEPATITIS

There are several forms due to course and clinical symptoms:

1. Carrier state (subclinical course) – except A and E.

2. Acute hepatitis:

a) Non-icterus form;

b) Icterus form;

c) Fulminant form;

***3. Chronic hepatitis*:**

a) Chronic persistent hepatitis;

b) Chronic active hepatitis.

ACUTE HEPATITIS

There are 4 stages in course of the acute hepatitis:

- ***Incubation period;***
- ***Pre-jaundice;***
- ***Jaundice;***
- ***Recovery.***

Hepatitis A and E have a short incubation period (several weeks), and hepatitis B and C - the longer one (up to several months).

ACUTE HEPATITIS

- Liver is enlarged and reddish. Liver edge is rounded; surface is smooth. Cholestasis gives greenish color.

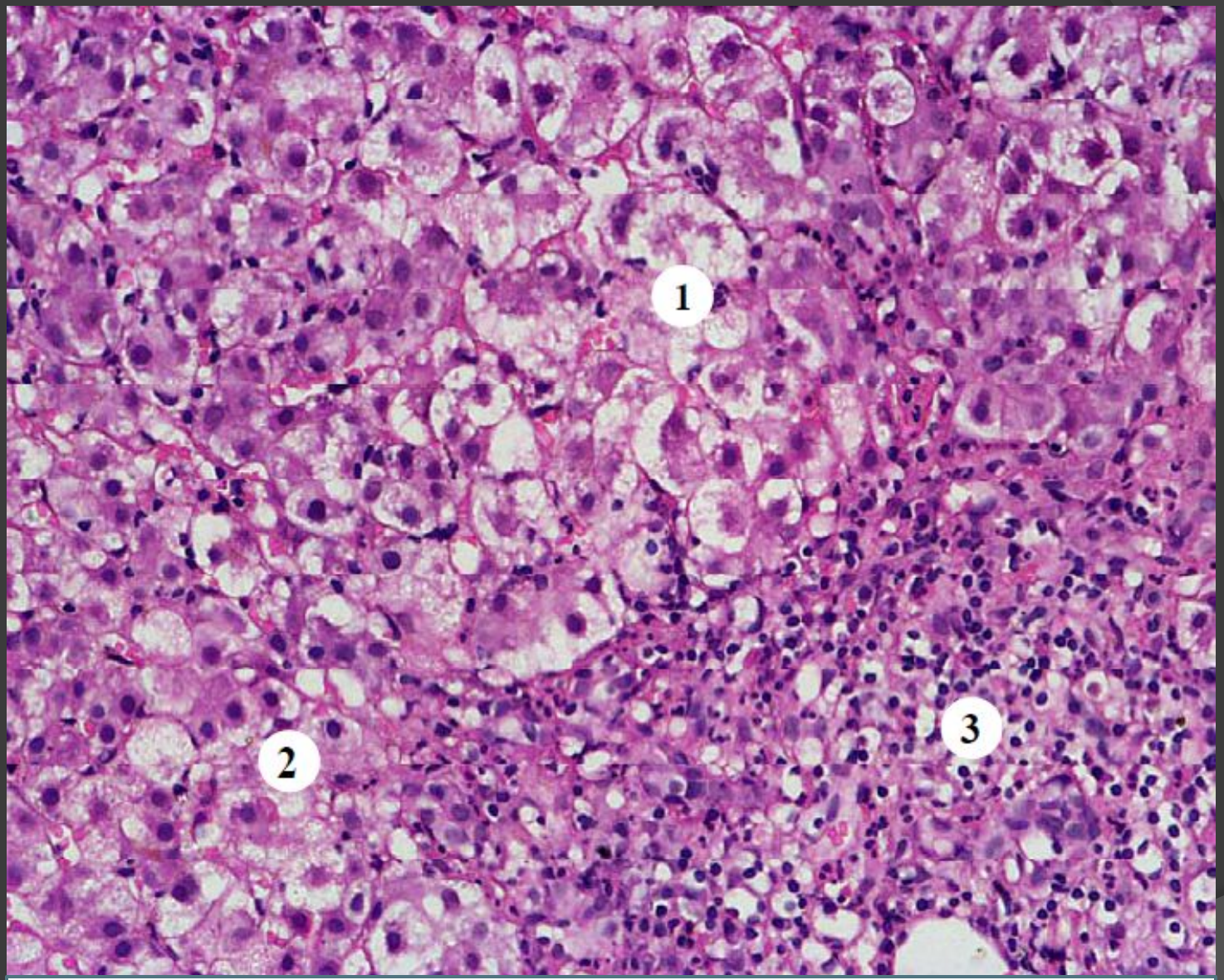
ACUTE HEPATITIS

- Diffuse damage of hepatocytes;
- Focal necrosis of groups or separate hepatocytes;
- Reaction of the Kupffer cells and inflammatory reaction;
- Regeneration of cells in recovery stage.

ACUTE HEPATITIS

- Necrosis of hepatocytes
  - Rapture of the cell membrane with cytolysis (cell «disappears»);
  - Coagulation necrosis with lysis of nucleus and formation of acidophylic bodies (Kaunsilmen's bodies).

  + piecemeal necrosis
  + bridging necrosis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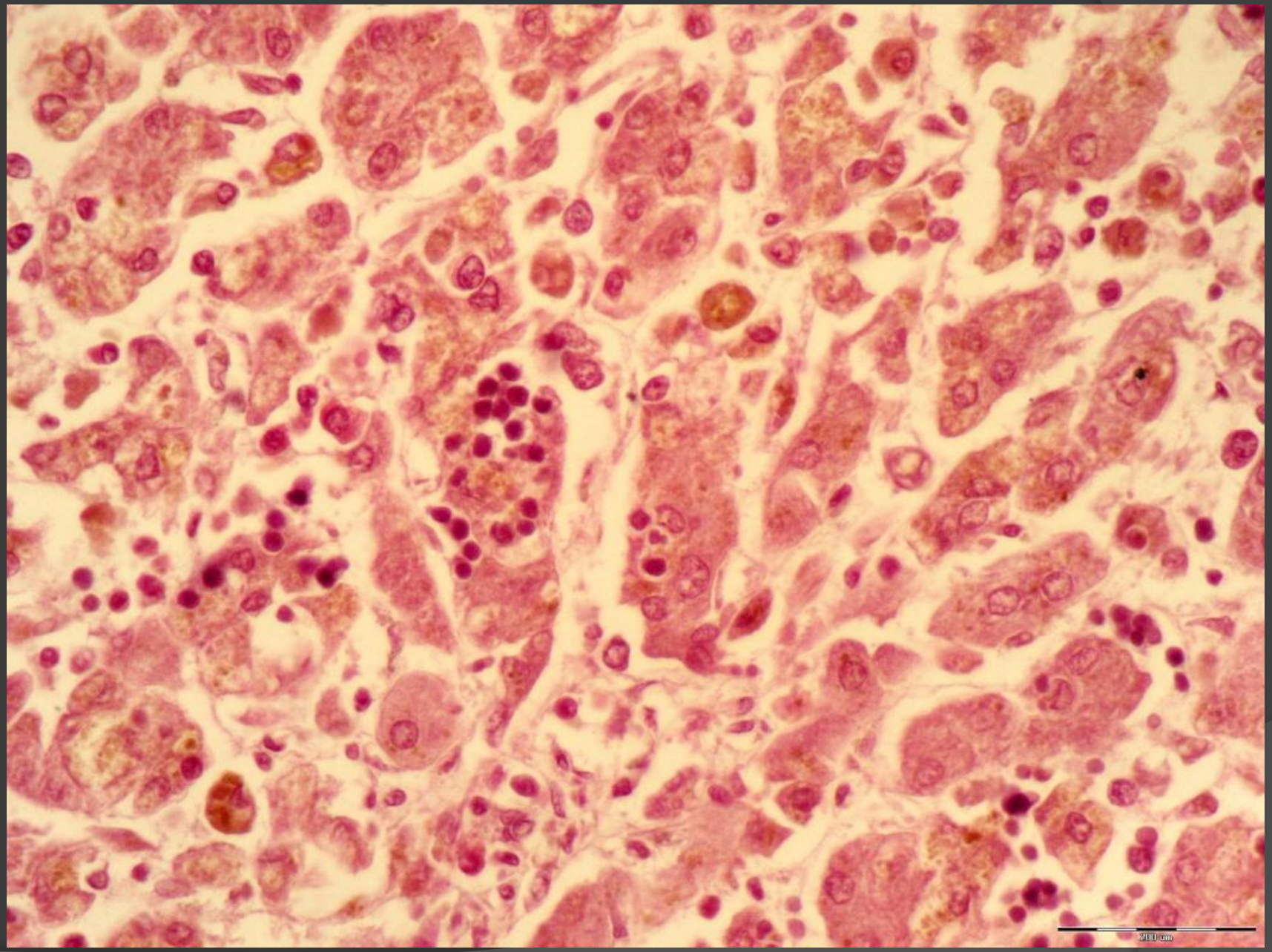


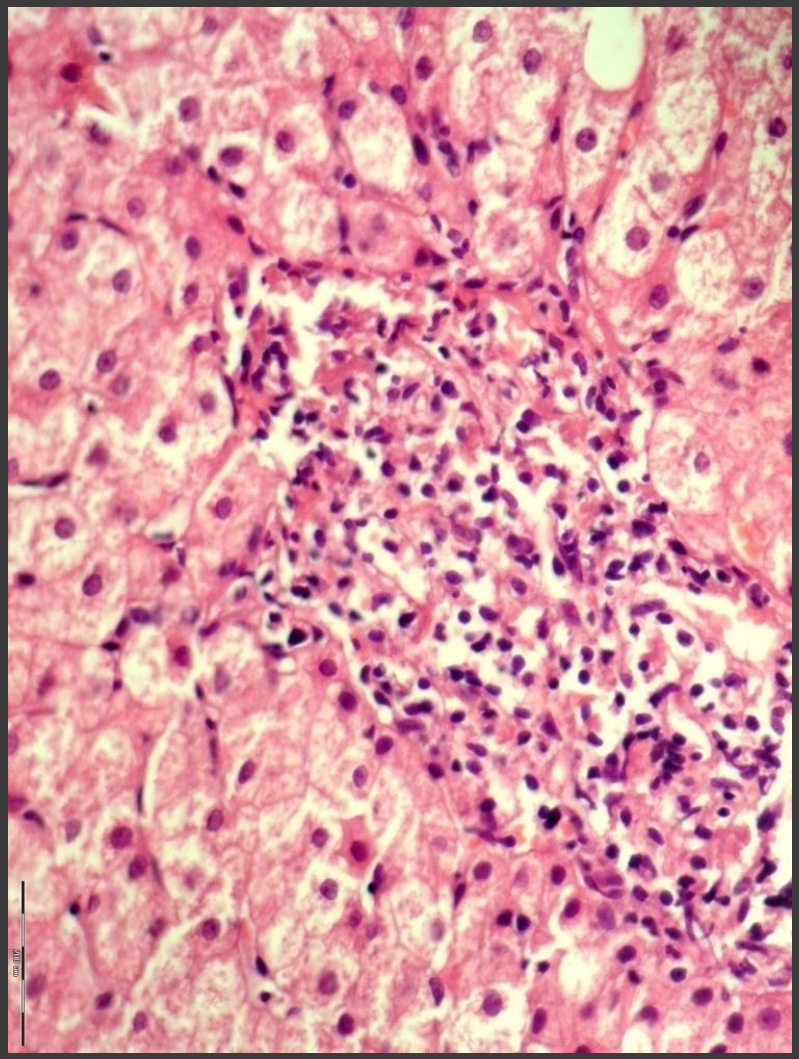
CHRONIC HEPATITIS

Chronic persistent hepatitis

- **Relapsing course, with NO observed progressive liver injury with NO outcome in cirrhosis or development of liver failure.**
- **Viral Hepatitis B and C**
- **Inflammatory infiltration of the portal tract with lymphocytes, plasmocytes and macrophages.**

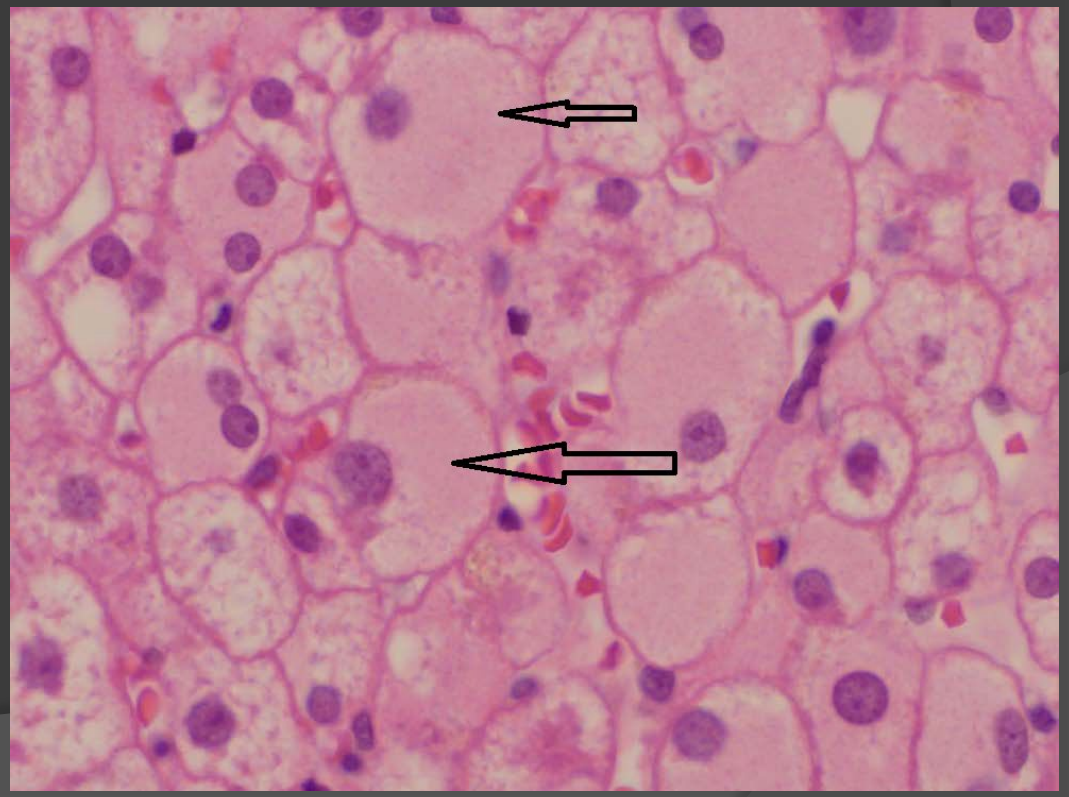
Piecemeal necrosis of hepatocytes

Hepatocytes look like "ground glass" (only in viral hepatitis B).



Inflammatory infiltration of the portal tract

"Ground glass" hepatocytes



CHRONIC HEPATITIS

Chronic active hepatitis

- Chronic active hepatitis is characterized by *progressive destruction of hepatocytes* and development of *cirrhosis*.

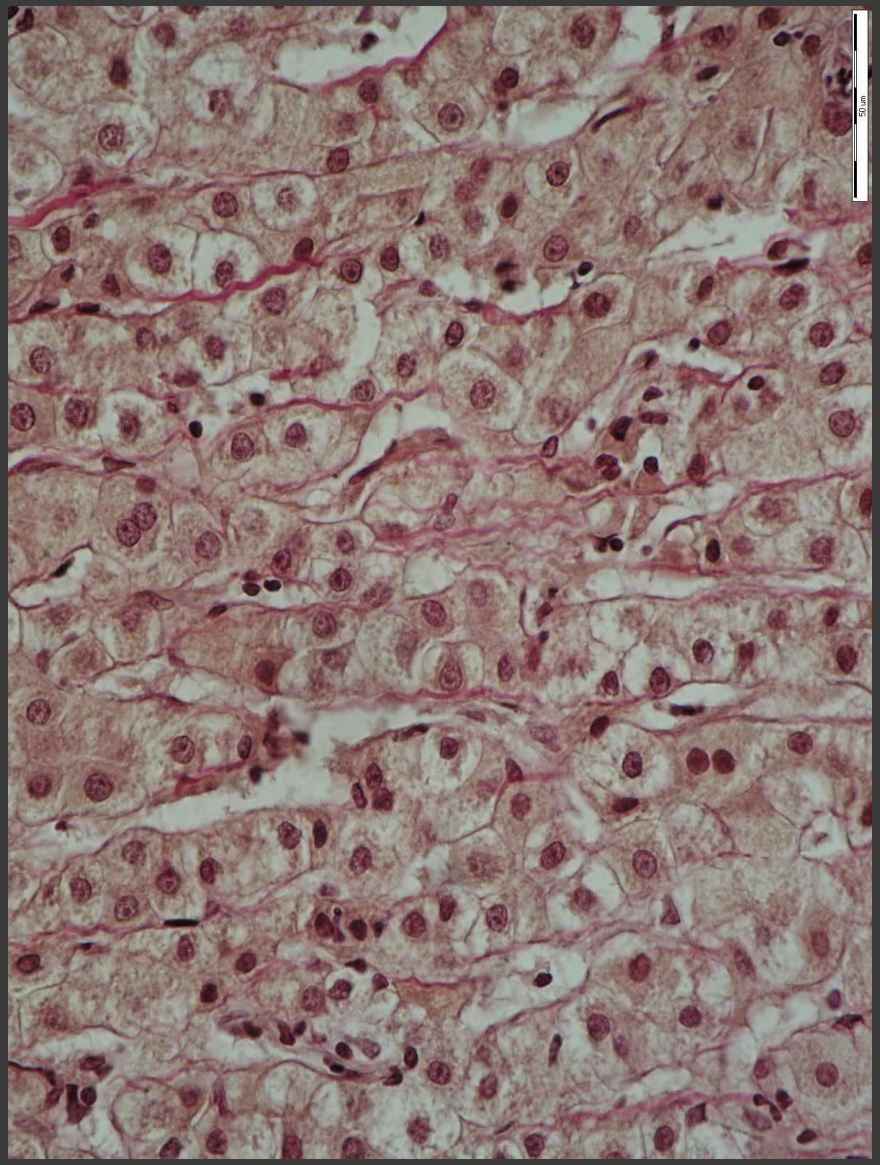
  Viral Hepatitis B – 20-30 % of patients;

  Viral Hepatitis C – 70-80 % of patients.
- + autoimmune hepatitis.

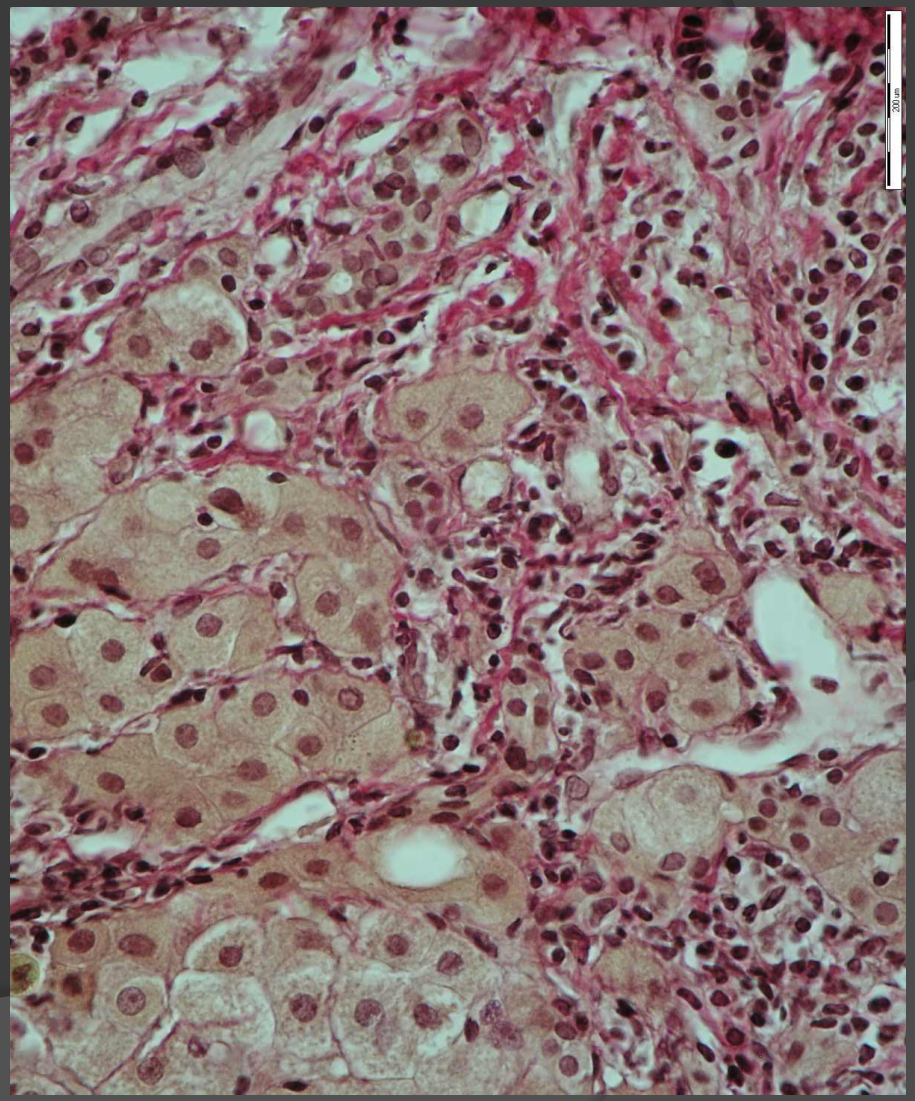
CHRONIC HEPATITIS

Chronic active hepatitis

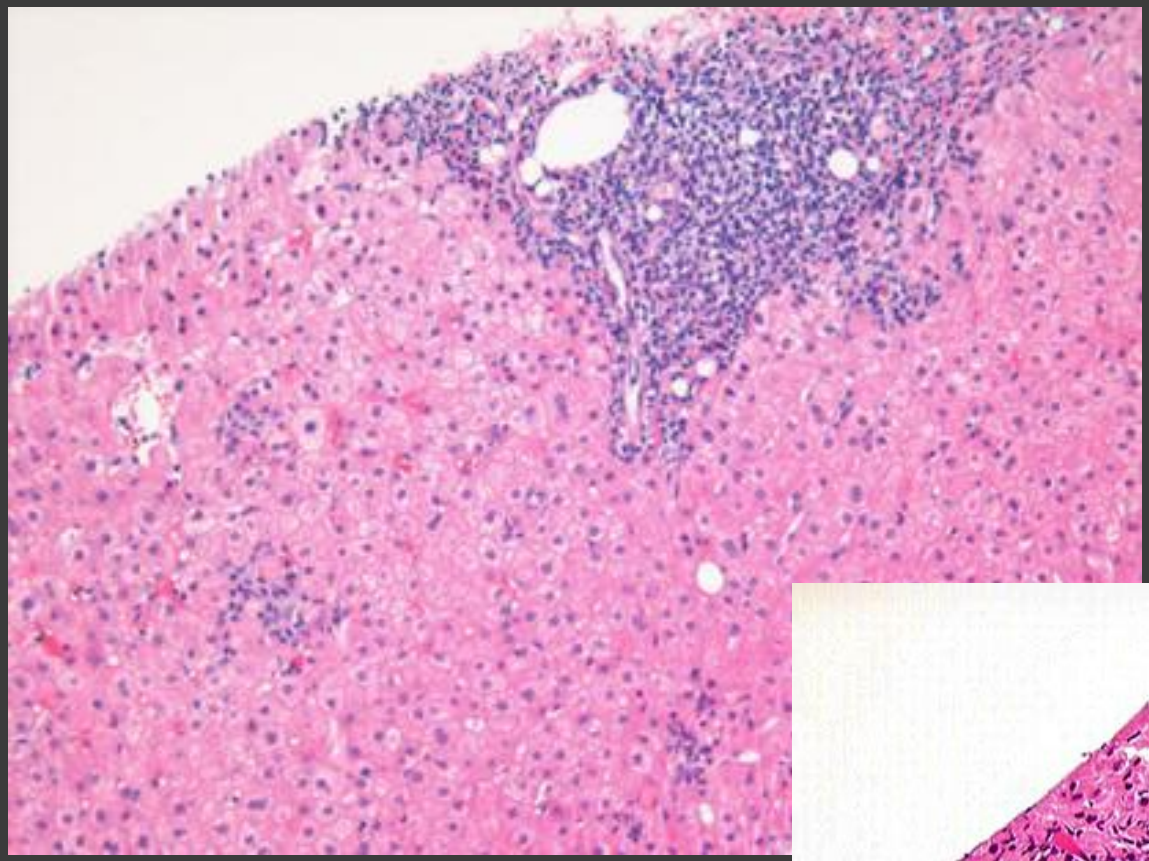
- Poratal and periportal **infiltration** with lymphocytes, plasmocytes and macrophages;
- Active **destruction** of hepatocytes in zone between inflammatory infiltration and surrounding hepatocytes (***piecemeal necrosis***);
- **Destruction** of hepatocytes with formation of bridge between portal tract and central vein (**bridging necrosis**);
- Progressive substitution of the necrosis foci by the fibrous tissue with **cirrhosis** development.

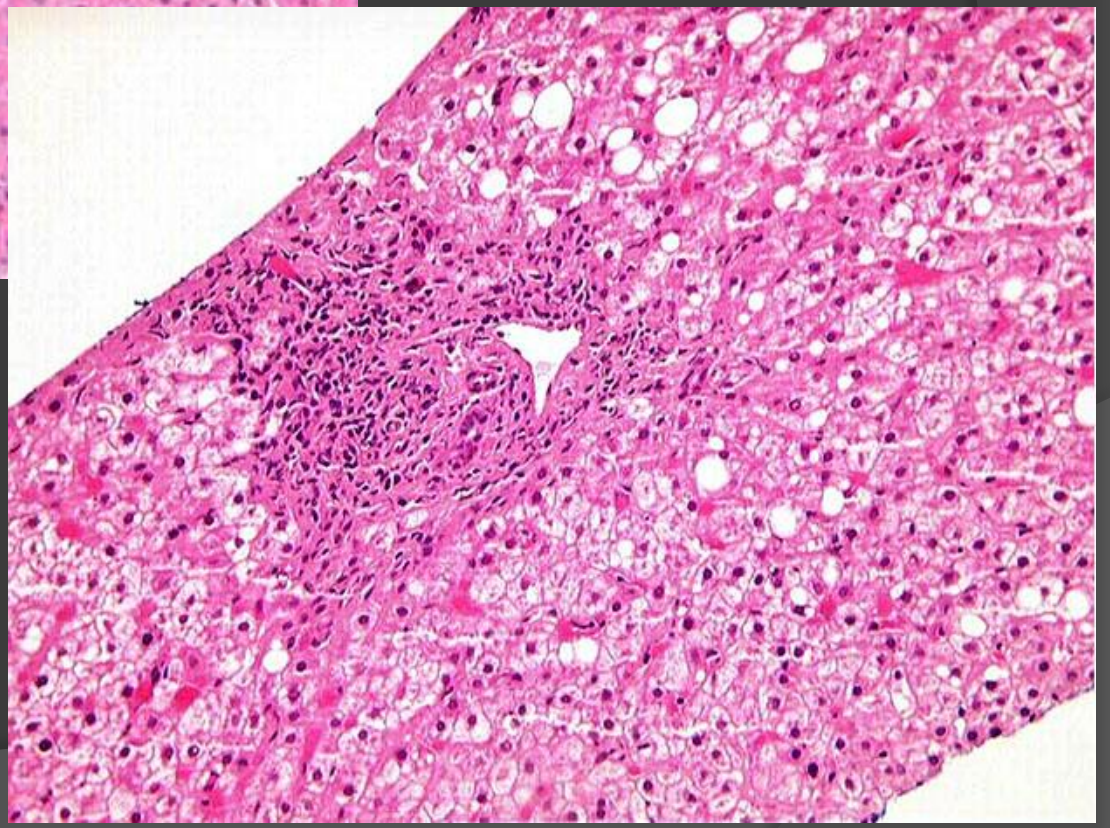


Capillarization of sinusoids - hypoxic damage of hepatocytes



Periportal fibrosis - hypoxic damage of hepatocytes





LIVER CIRRHOSIS

- Liver cirrhosis is characterized by the following sings:

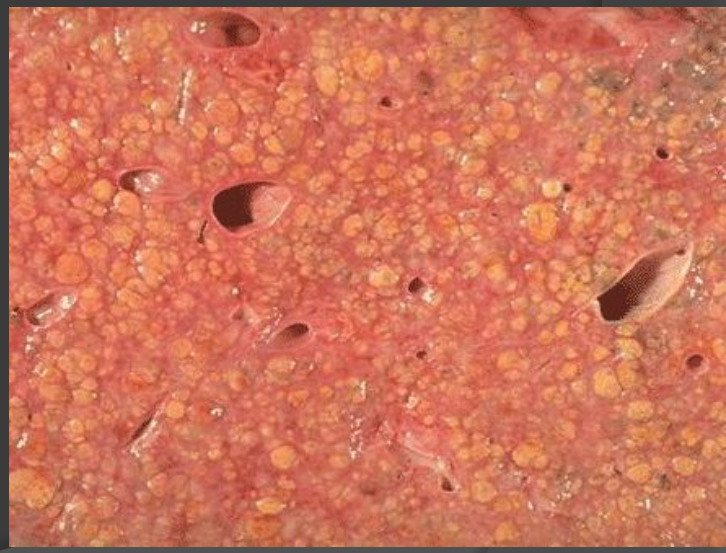
1. Dystrophy anв necrosis of hepatocytes
2. Fibrosis;
3. Compensatory hyperplasia of hepatocytes with formation of regenerates nodes;
4. Deformation of the liver.

LIVER CIRRHOSIS

CLASSIFICATION

Morphological **:**

- **Micronodular liver cirrhosis**
- **Macronodular liver cirrhosis**
- **Mixed liver cirrhosis**



***Ethiological*:**

1. Acquired forms

- **Toxic cirrhosis (such as alcoholic)**
- **Postinfectious**
- **Circulatory**
- **Cryptogenic cirrhosis**
- **Biliary cirrhosis (primary, secondary)**

2. Congenital forms:

cirrhosis in hemochromatosis, thalassemia, Wilson's disease, a-1-antitrypsin deficiency, galactosemia, etc.

Pathogenetic:

- Portal
- Postnecrotic
- Biliary
- Mixed

LIVER CIRRHOSIS

COMPLICATIONS

1. **Liver failure (acute or chronic, up to hepatic coma)**
   - ***Hepatic encephalopathy***
   - ***Jaundice***
   - ***Renal failure***
   - ***Ascites and edema***
   - ***Endocrine disorders***
   - ***Circulatory disorders***
   - ***Secondary infections***

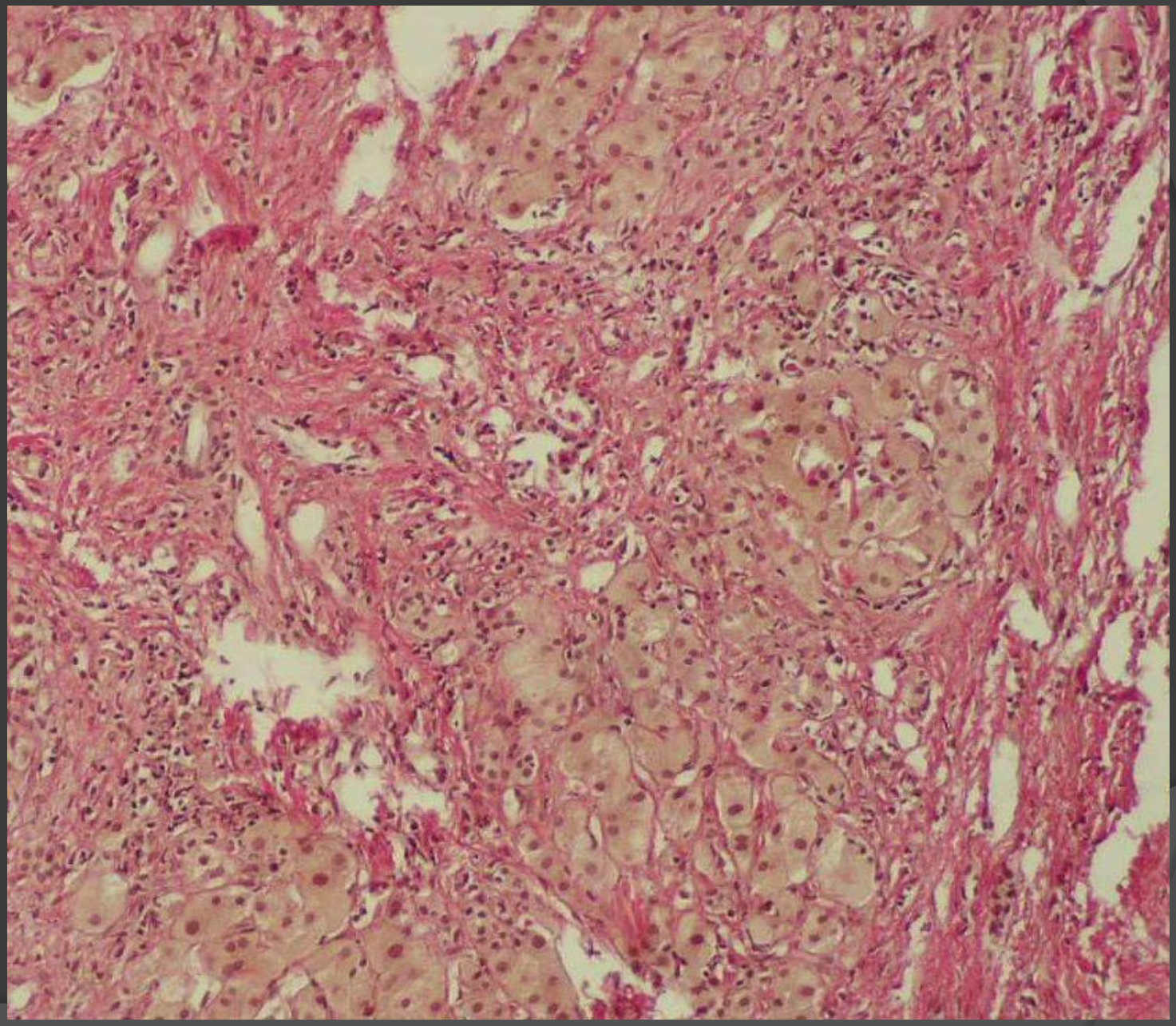
2. Portal hypertension

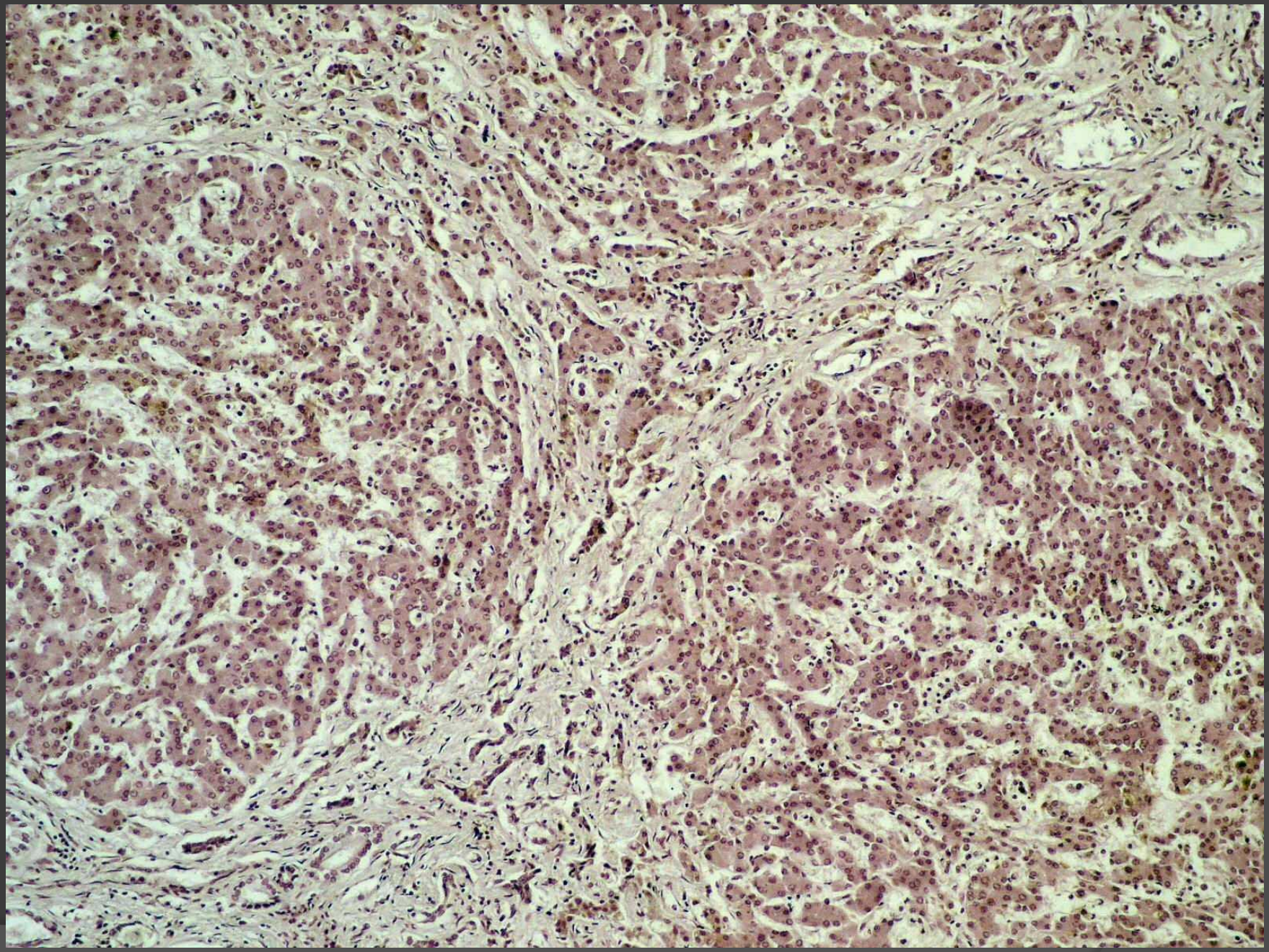
Varicose changes in portocaval extrahepatic anastomoses

Ascites

Splenomegaly

3. Cancer of the liver





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