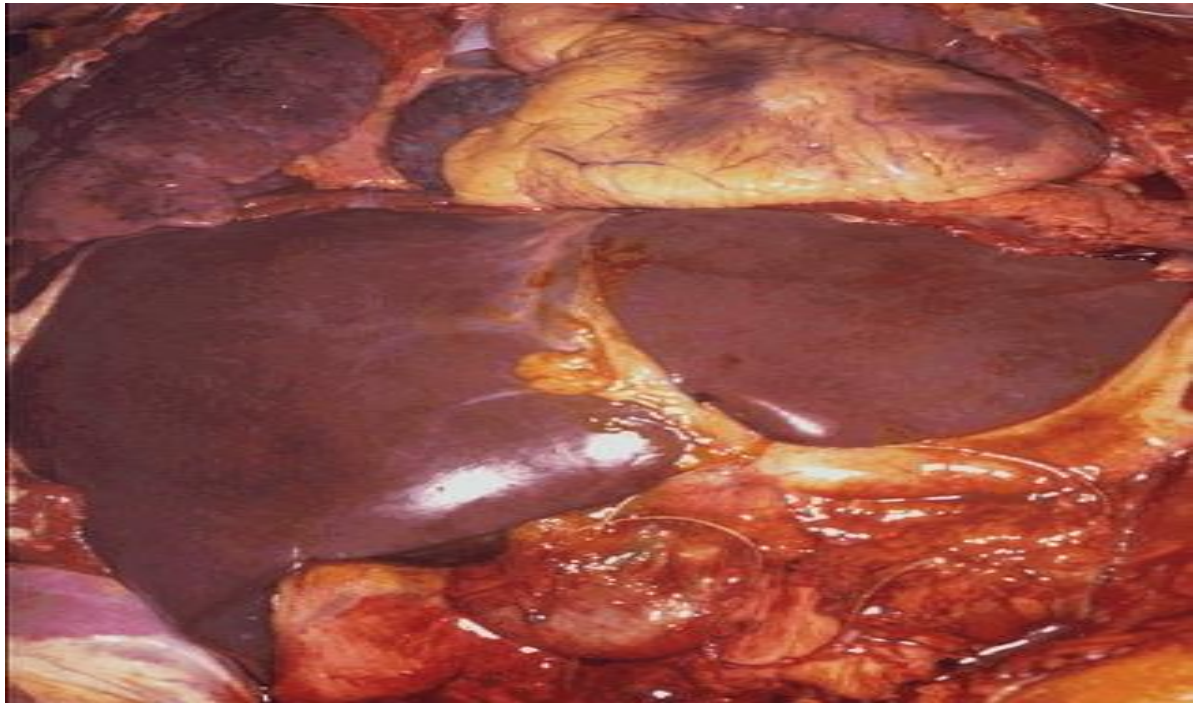
PATHO IMAGES (1-3)

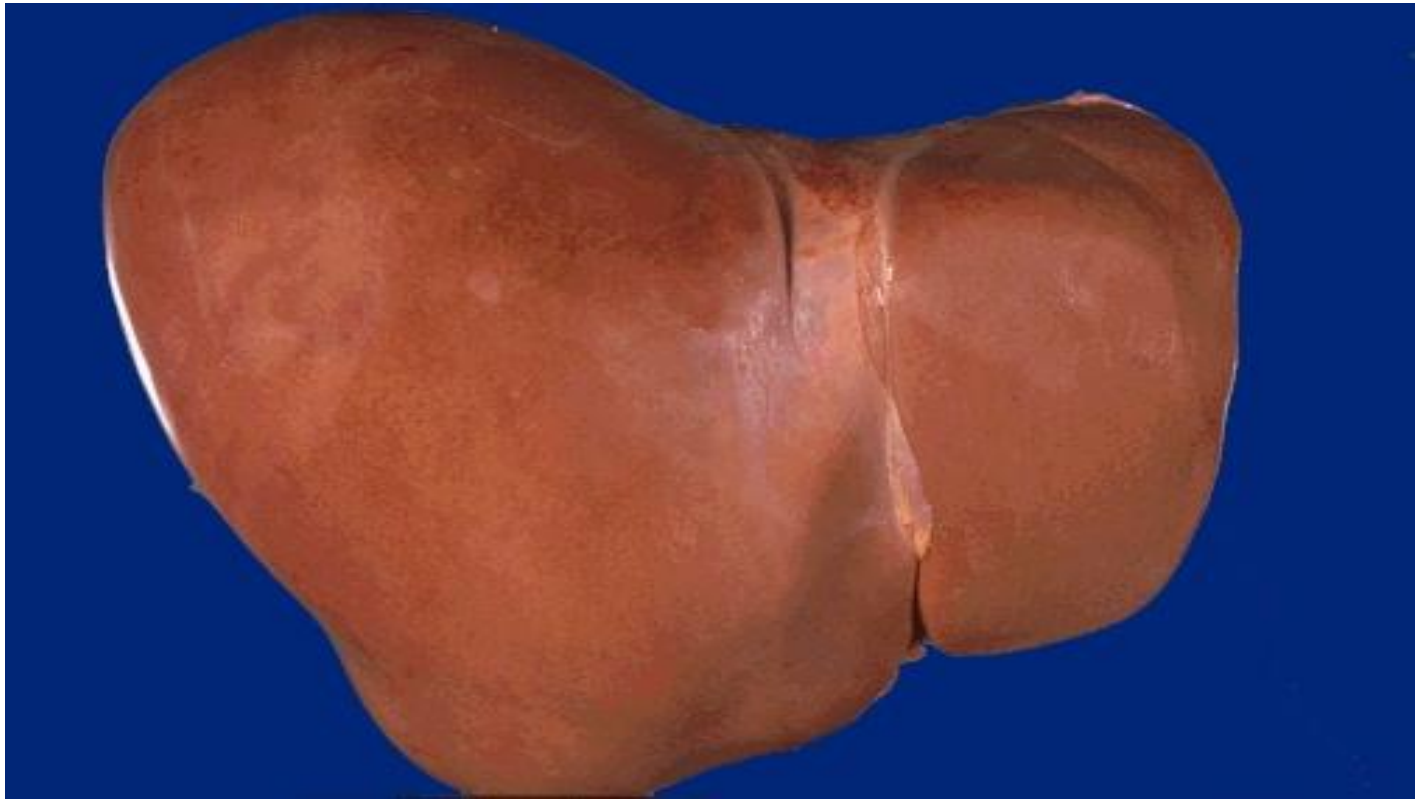
Done by: Mahmoud Aljunaidi (ft. Laith Alhuniti)

Normal liver



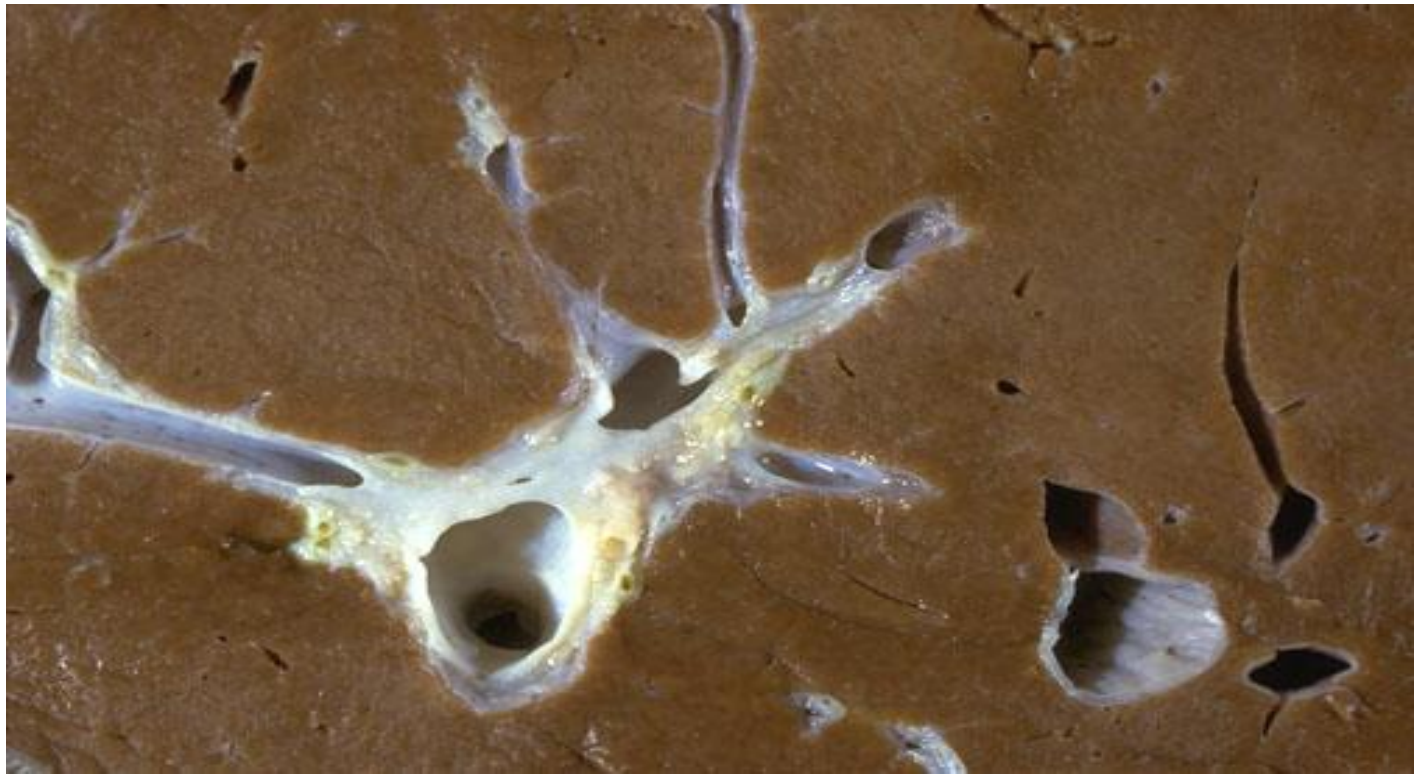
- The normal liver has a smooth, shiny surface with well-preserved structures. It is brownish in color.

Normal liver



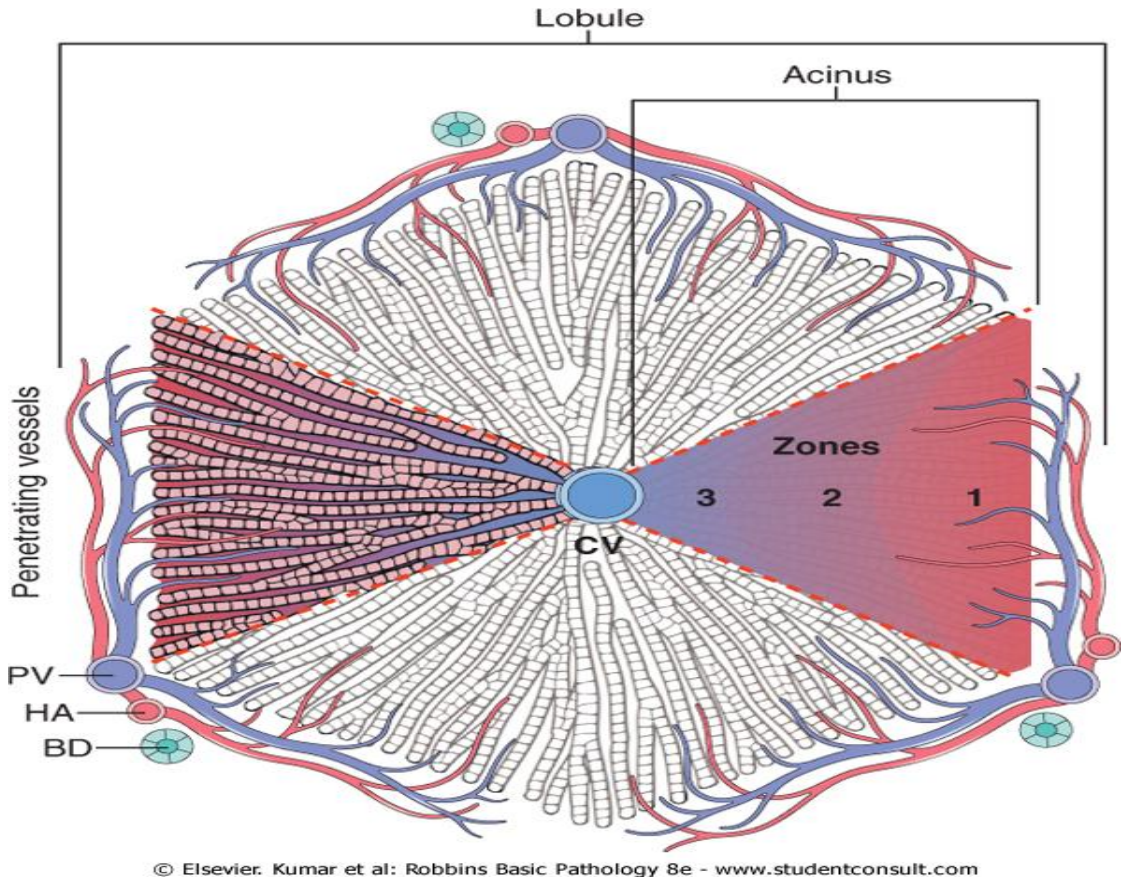
- The same applies here, but without the presence of fat or surrounding structures.

Normal liver



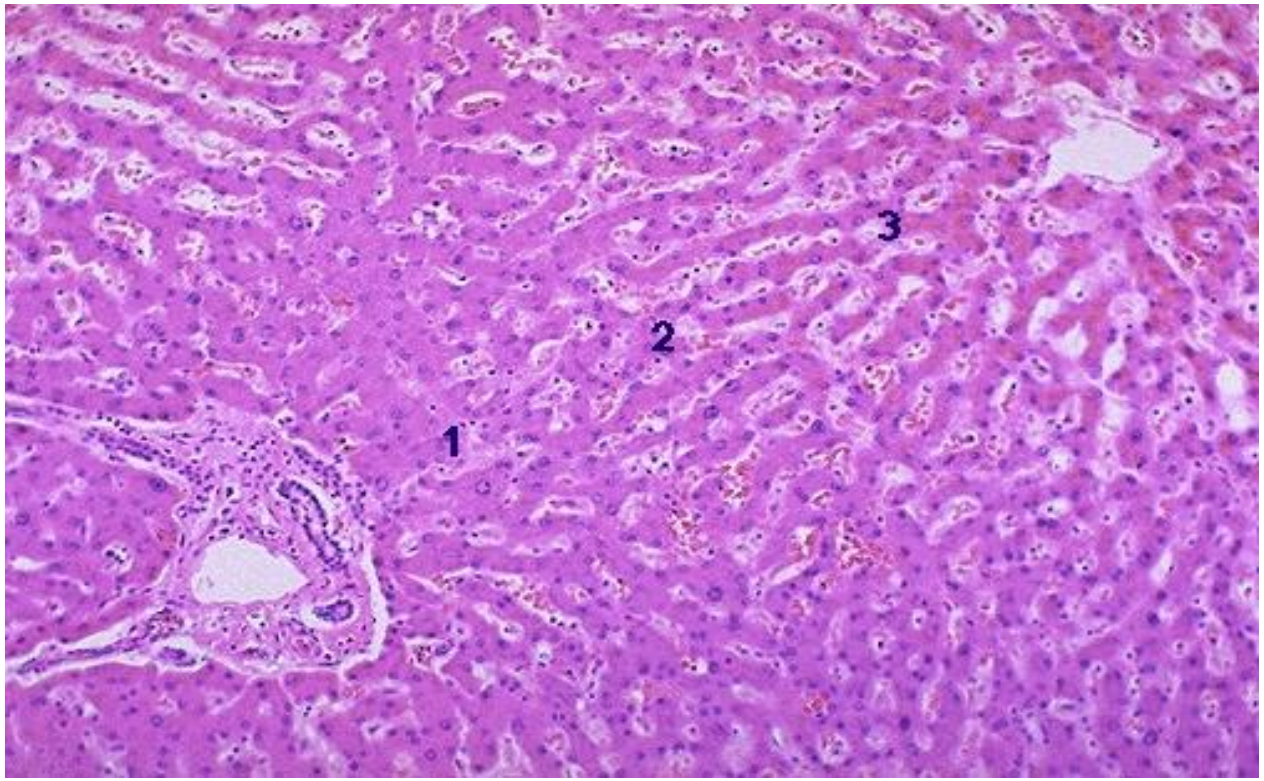
- Normal liver parenchyma and vessels

Liver structure



- This is the hexagonal functional unit of the liver. It consists of six triangular sections, each known as an **acinus**.
- A central vein is located at the center of the hexagon. At each corner of the hexagon, there is a portal vein, hepatic artery, and bile duct.
- Between these structures lies the hepatic parenchyma, which is primarily made up of hepatocytes.
- These cells are separated by sinusoids, vascular spaces lined with epithelial cells that also contain Kupffer cells.

Liver zones

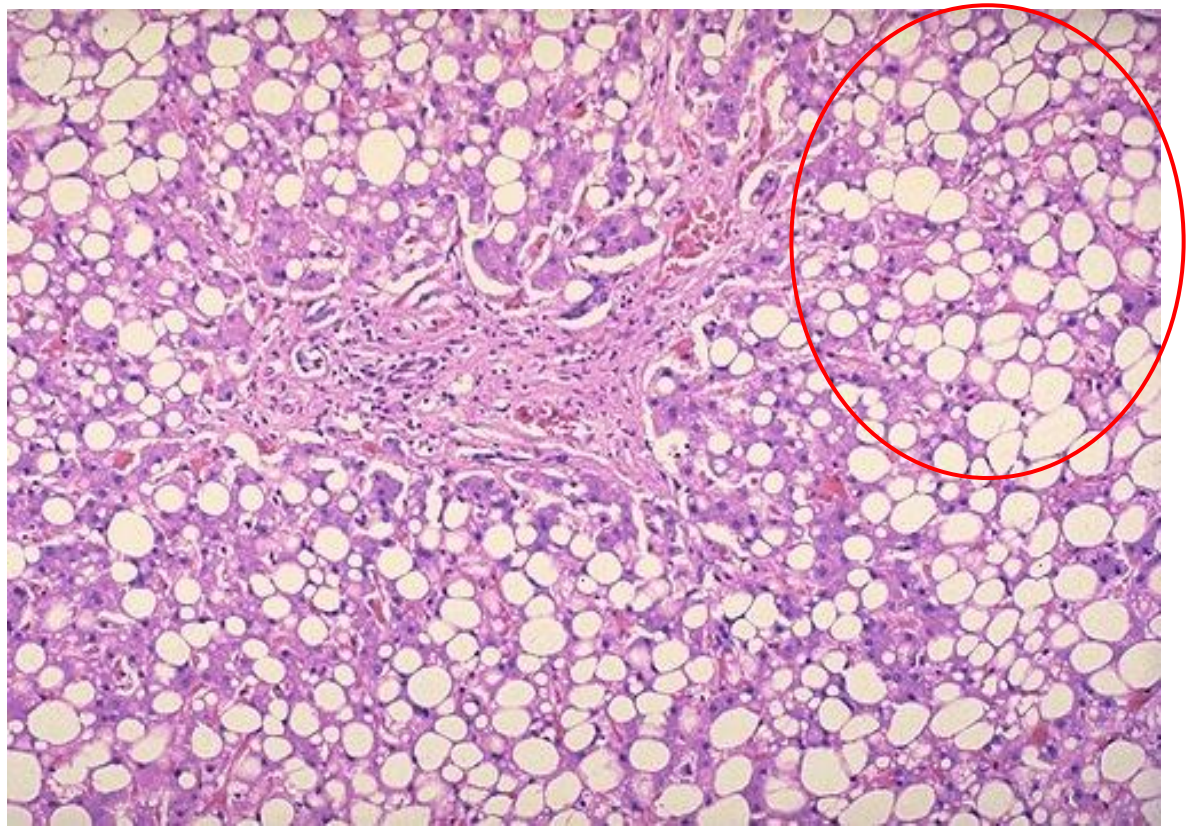


- Hepatocytes are arranged in one-cell-thick lines, or occasionally two cells thick.
- Any arrangement thicker than that is considered abnormal.
- The central vein can be seen on the right, and the portal triad area, containing the portal vein, hepatic artery, and bile duct, is on the left. The three zones are not distinctly separated by clear boundaries.

Fatty change

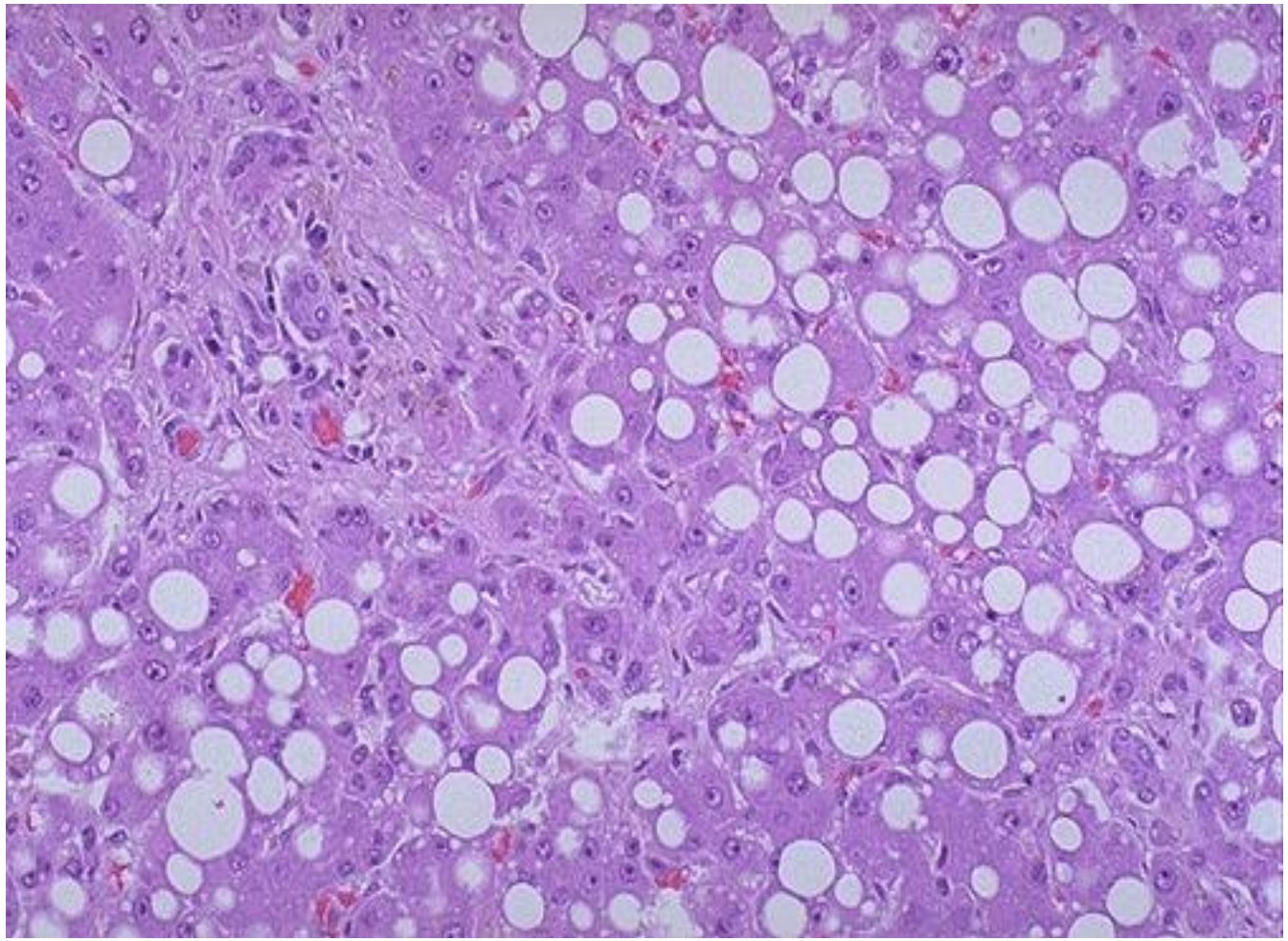
- This is a cross-section of a liver affected by severe fatty infiltration. The color difference is noticeable, as fat typically appears **yellow**. The liver also has a greasy consistency.
- Over time, chronic fatty infiltration can lead to additional visible changes. It's important to note that fatty change in the liver is a clinical finding rather than a diagnosis on its own. It reflects an underlying condition rather than being a standalone disease.
- The presence of fatty infiltration should be considered a red flag, prompting further investigation to identify the root cause or contributing factors.

Fatty change



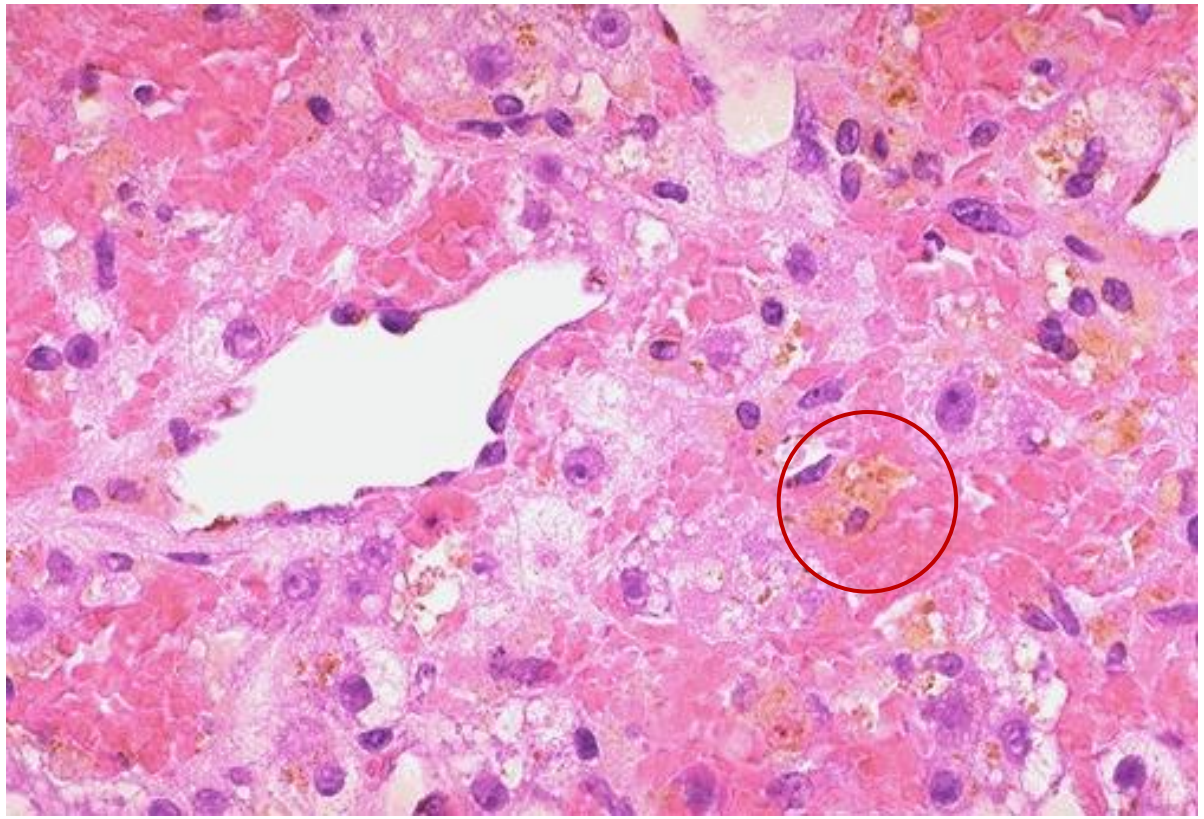
- The ballooning seen in the hepatocytes is caused by the accumulation of fatty material within the cells.
- In the image, the round, empty-appearing spaces represent areas that were filled with fat. During slide preparation, solvents are typically used, which dissolve and remove the fat, leaving behind these clear spaces.
- The involvement is considered severe, as nearly all hepatocytes are filled with fat, and the cytoplasm appears significantly expanded—especially in the central region. This central expansion may indicate the presence or onset of fibrosis.
- Identifying fibrosis is a critical aspect of liver examination, as it can be associated with both the development and progression of chronic liver disease.

Fatty change



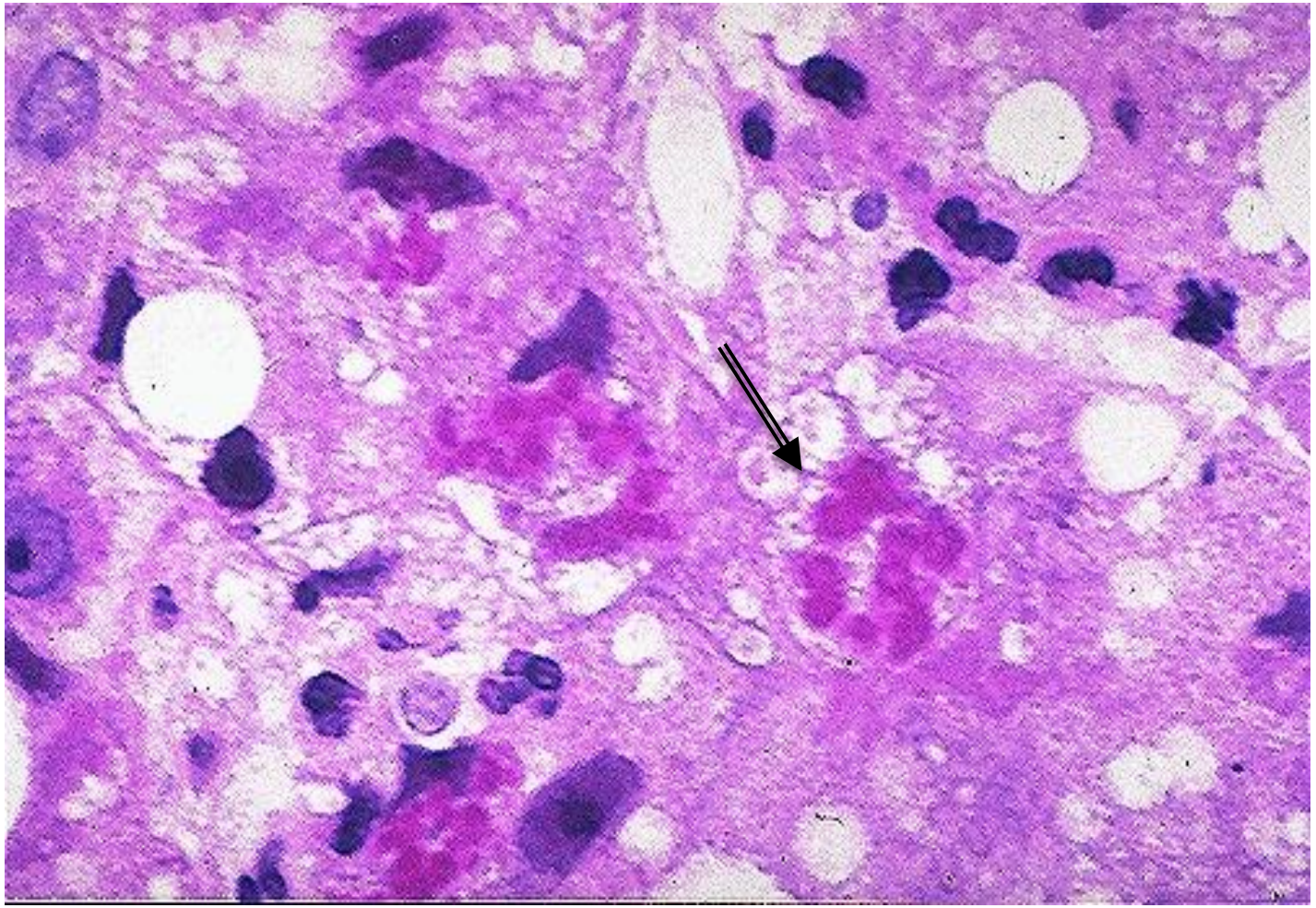
- This is a higher magnification view of the liver tissue, where numerous empty spaces resembling Swiss cheese can be observed. These spaces indicate extensive fat infiltration within the liver parenchyma.

Hepatic necrosis



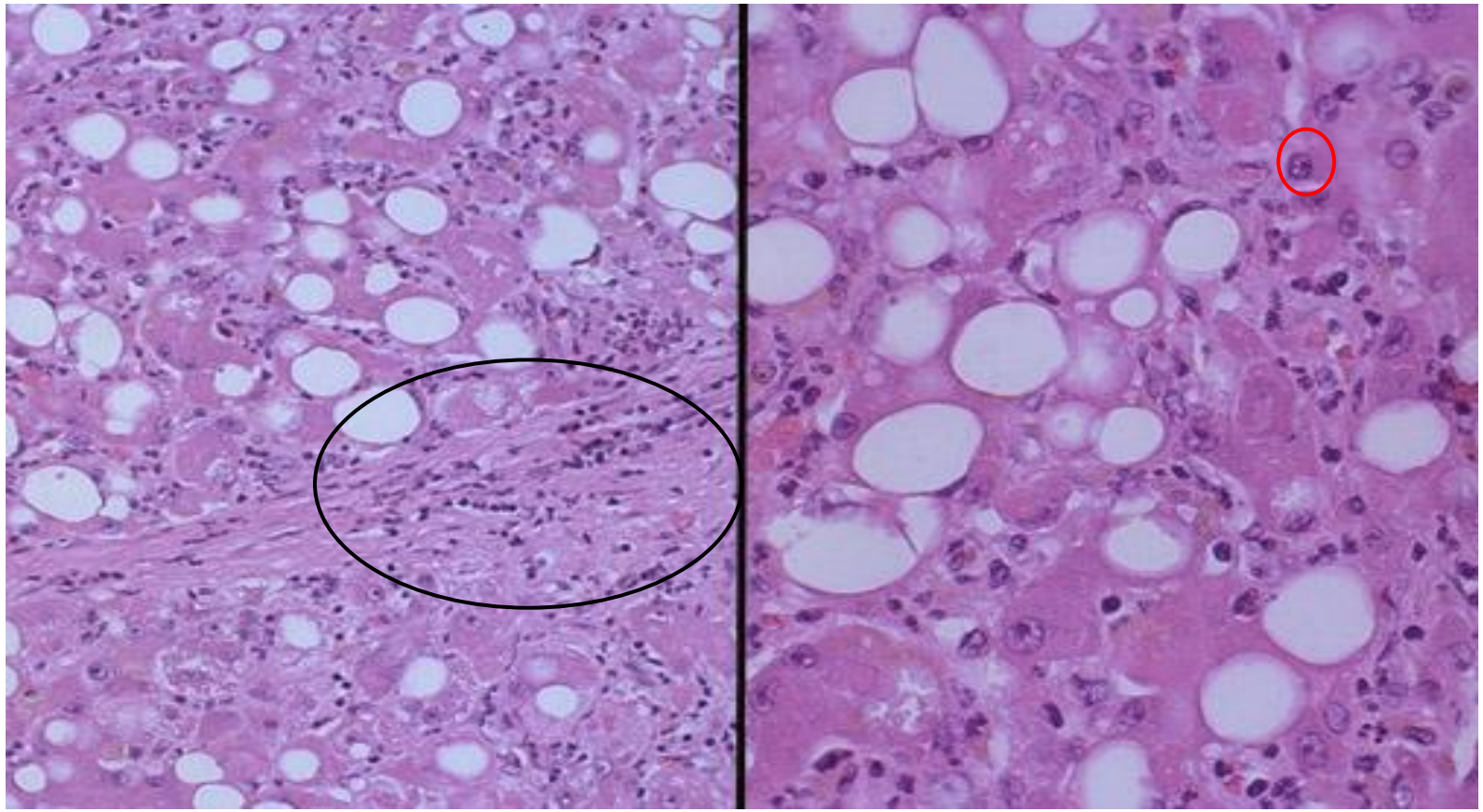
- This figure shows liver tissue exhibiting necrosis, where the cells lacking nuclei are necrotic.
- The main issue here is the deposition of bile pigment, which could potentially be **hemosiderin**.
- Special staining techniques are required to distinguish between the two.
- To identify the underlying cause, it's essential to review the patient's medical history and collect further clinical information.

Mallory-hyaline bodies



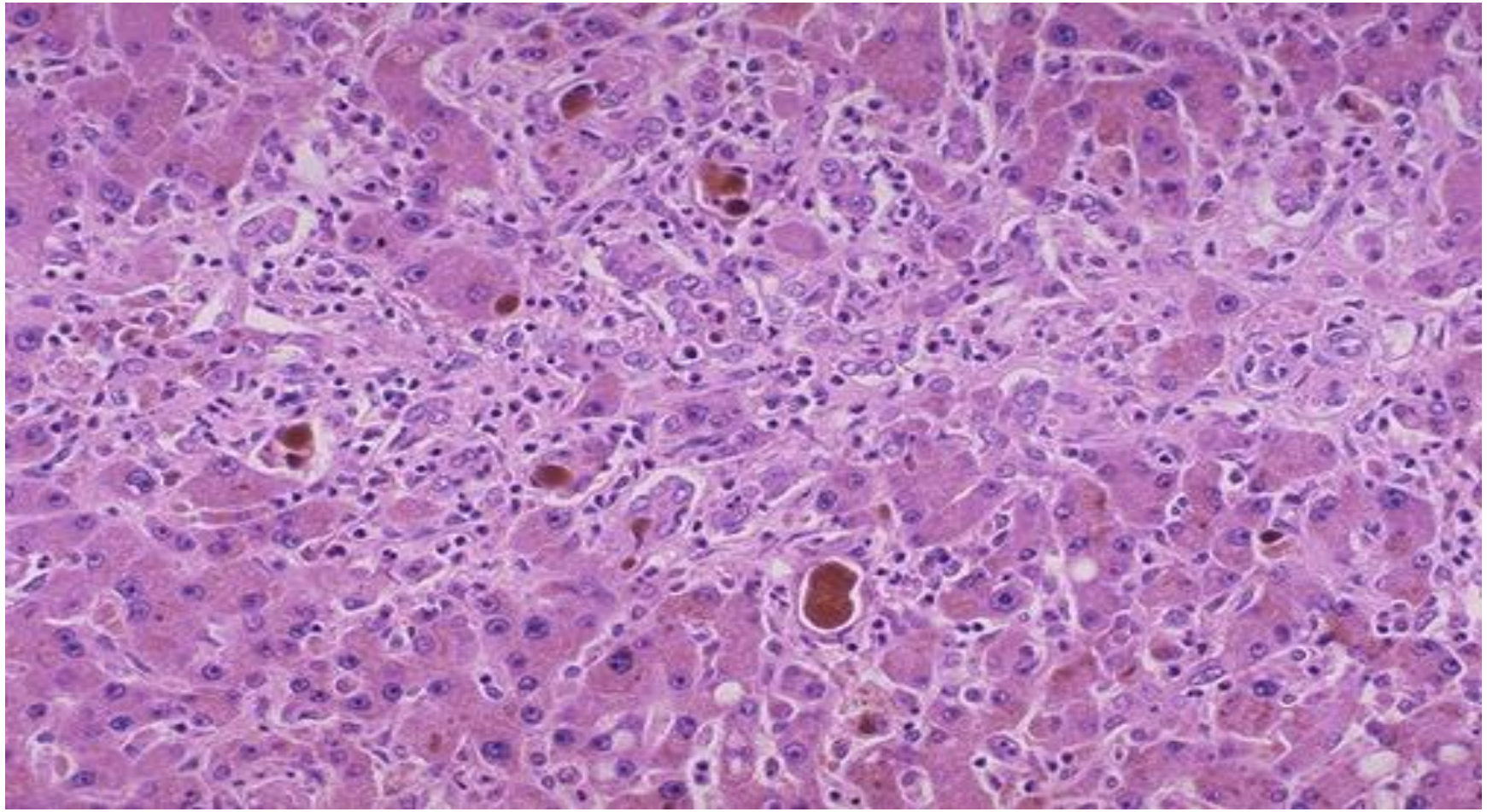
- This image shows fatty change in the liver.
- The hepatocyte cytoplasm appears enlarged and eosinophilic.

Alcoholic hepatitis



- This image shows fibrous tissue indicative of fibrosis, suggesting a chronic condition.
- Normally, healthy liver tissue does not exhibit fibrosis.
- Lymphocytes
- White circles are fat, thus fatty change is observed.

Cholestasis



- Bile salts and hemosiderin both appear brown in color.
- However, they can be differentiated using special staining techniques.

Alcoholic cirrhosis

- This figure demonstrates the gross appearance of a **fibrotic liver**. The surface is irregular and has been replaced by small nodules, a condition referred to as **micronodular cirrhosis (<3mm)**.

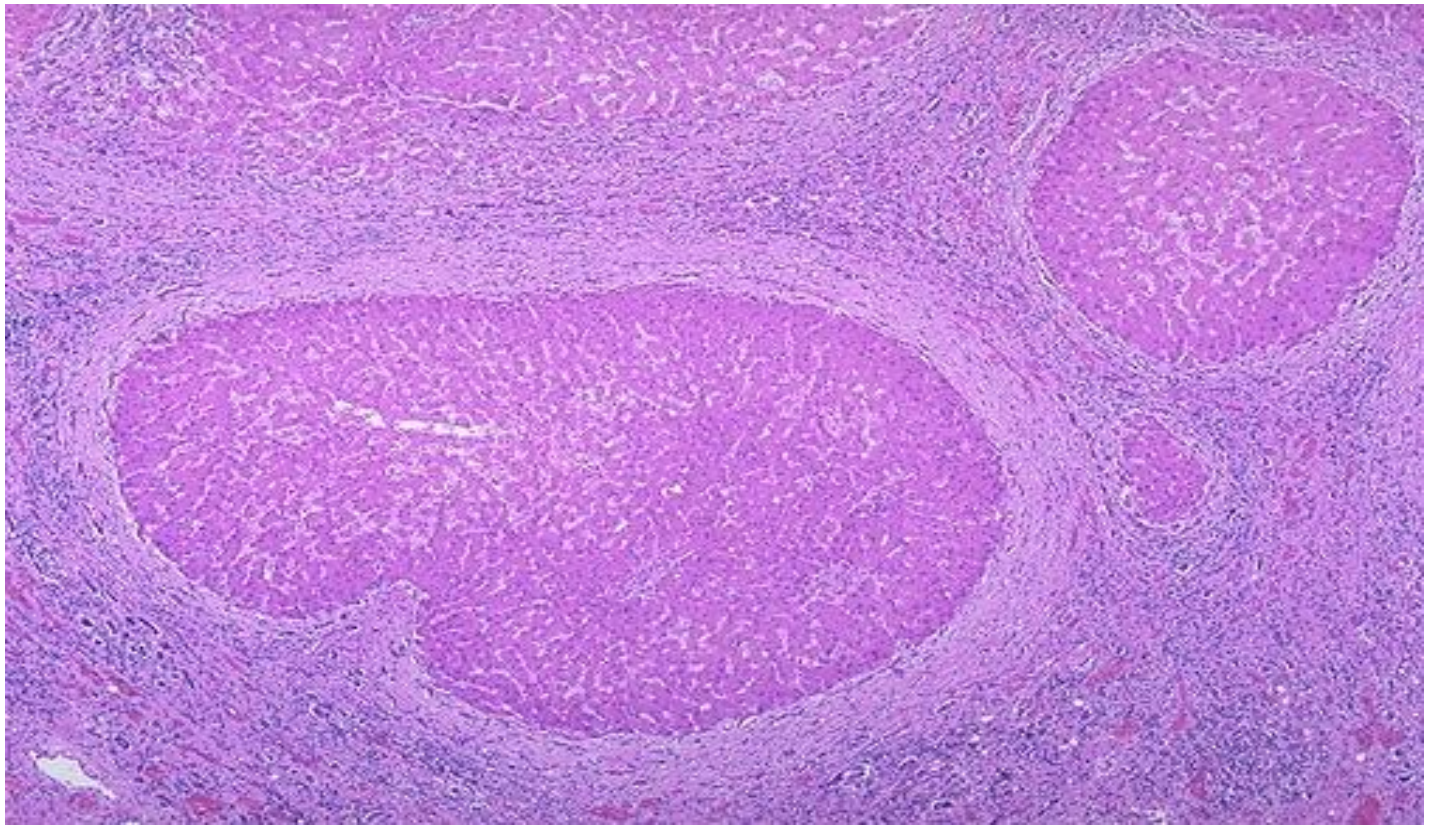
Micronodular cirrhosis

- This is the gross appearance of the liver surface, showing small, diffuse nodules that involve the entire liver.

Macronodular cirrhosis

- Macronodular cirrhosis results in scarred and distorted liver tissue due to the retraction of fibrous tissue, leading to deformation of the liver's structure.

Cirrhosis



- This is a microscopic view of cirrhosis, showing nodules of varying sizes composed of regenerative hepatocytes (parenchyma) surrounded by **fibrous tissue**.

– Within the fibrous tissue, blood vessels and inflammatory cells are present.

– The parenchyma itself consists of regenerative hepatocytes capable of performing some liver functions. This explains why patients with cirrhosis may survive for years with near-normal liver function and may remain asymptomatic due to the activity of these regenerative nodules.

caput medusae

- Dilated, twisted veins on the anterior abdominal wall, resembling varicose veins.

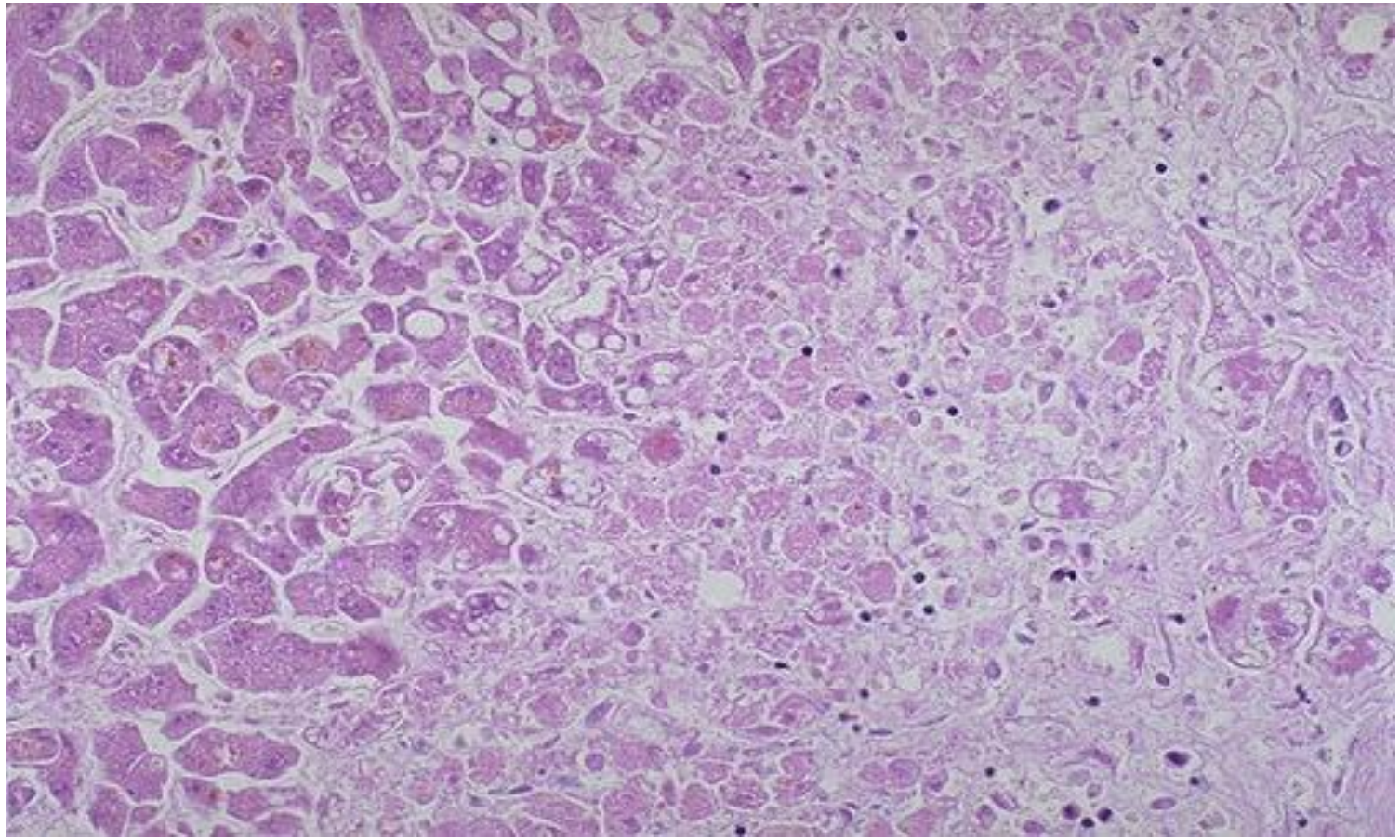
Esophageal varices

- You can see dilated veins in the lower esophagus, which are not normal.
- On the right is the esophagus, while on the left is the stomach.

Splenomegaly

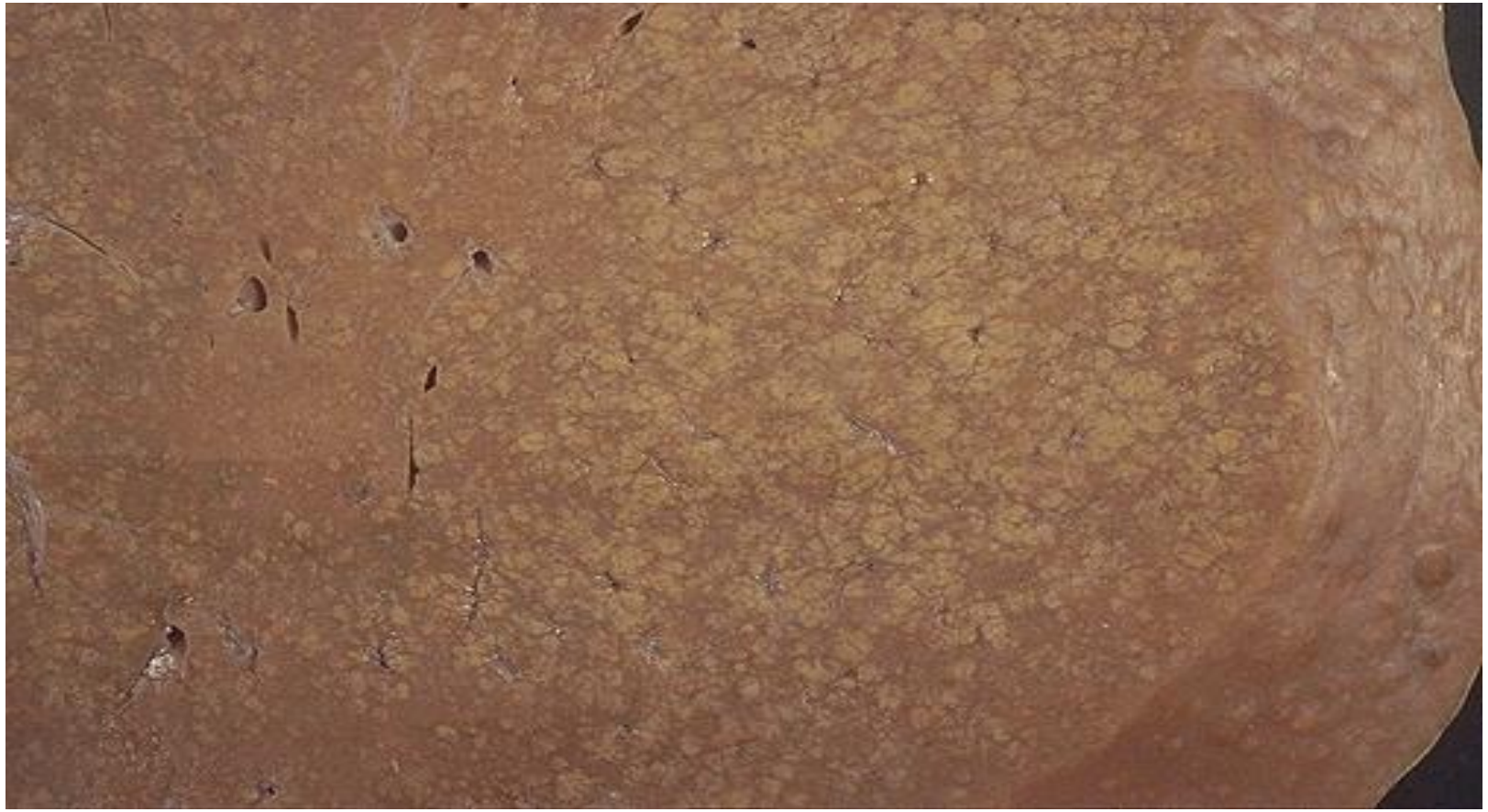
You can see that the spleen is enlarged.

Hepatic necrosis

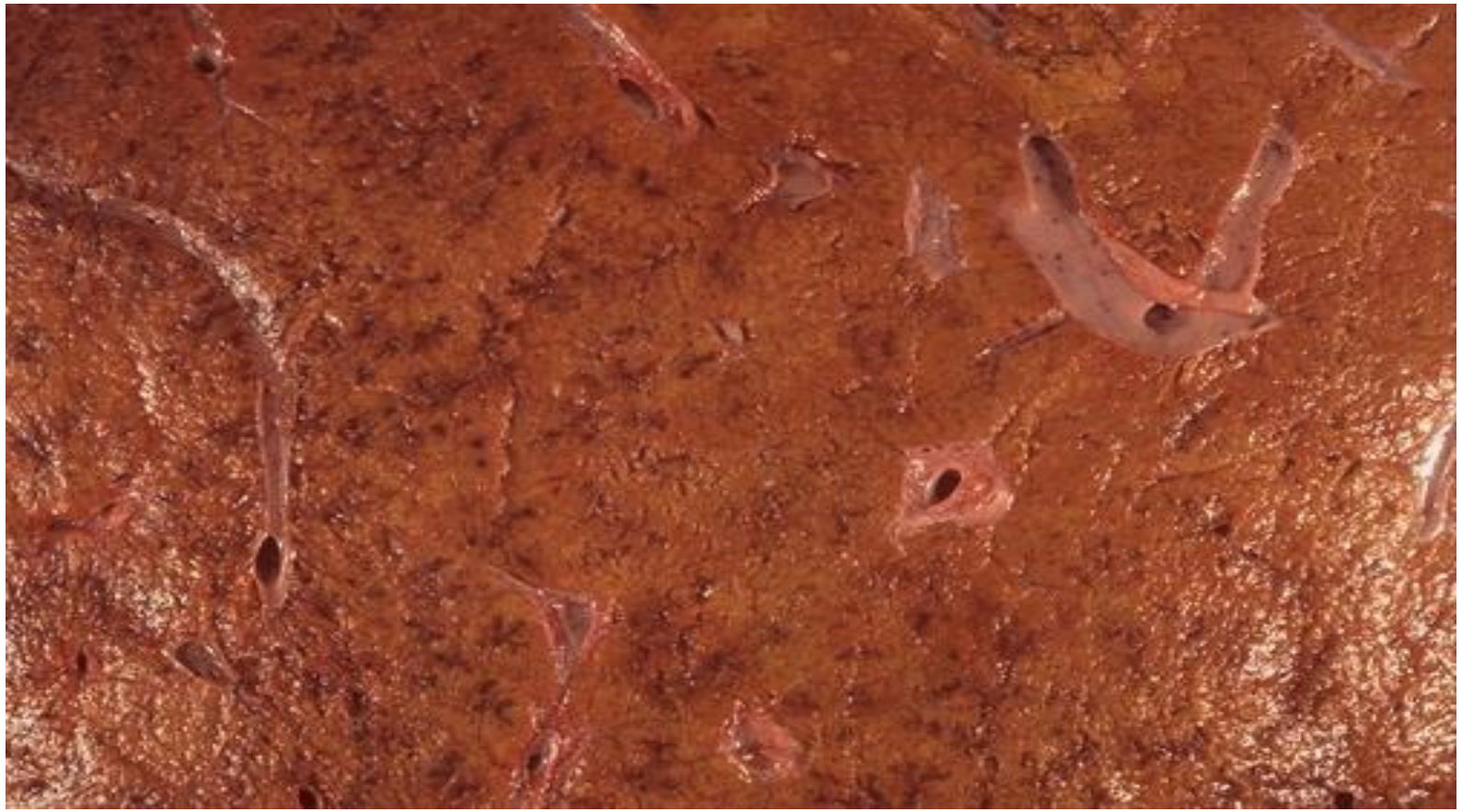


- The left side shows preserved hepatocytes without any signs of necrosis.
- The right side displays necrotic changes, characterized by pale cytoplasm and loss of nuclei.

Necrotic liver

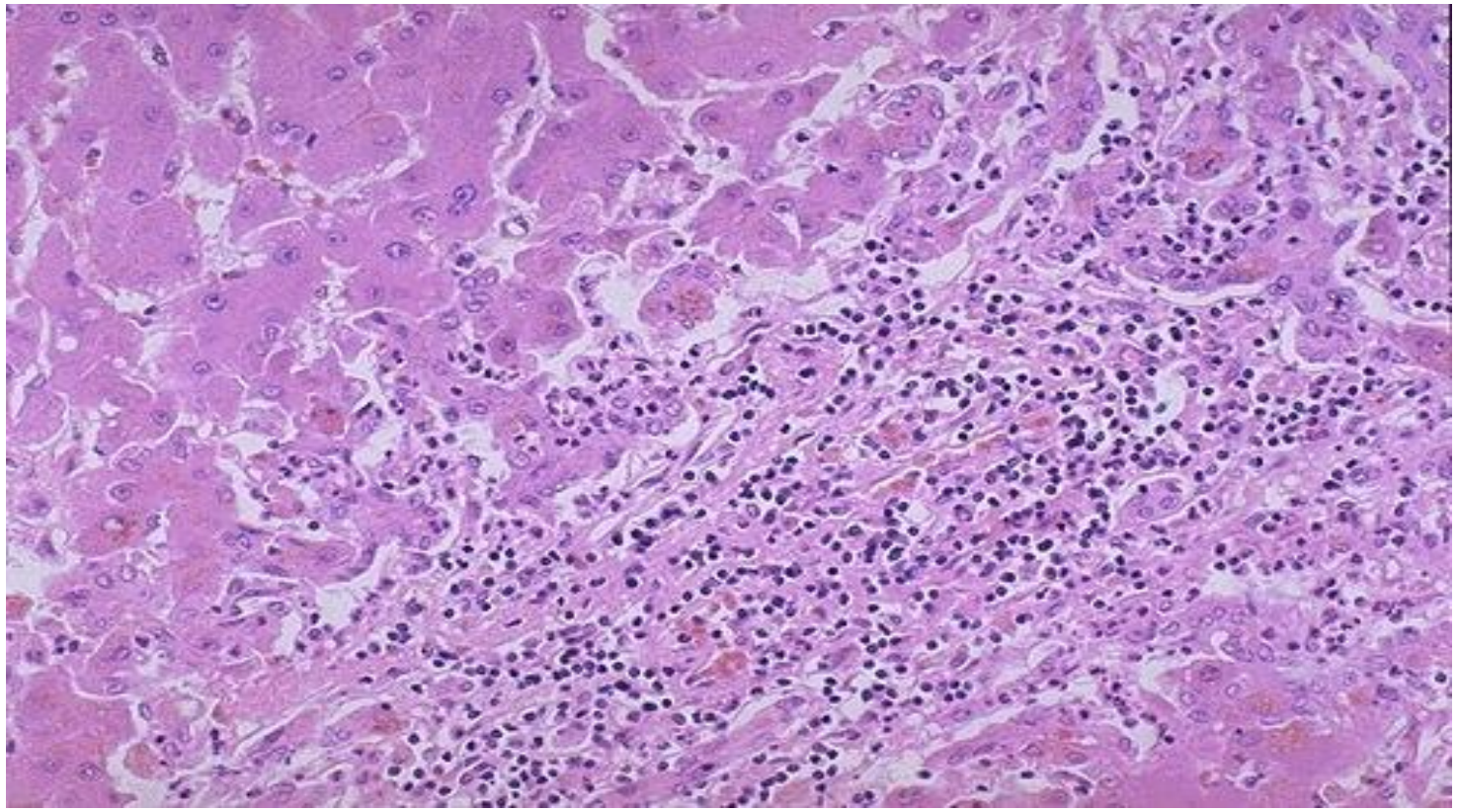


- This image shows the liver with areas of necrosis. The pale regions represent necrotic tissue.
- The extent of necrosis varies, and there is a noticeable loss of tissue homogeneity, these are key indicators of necrosis.



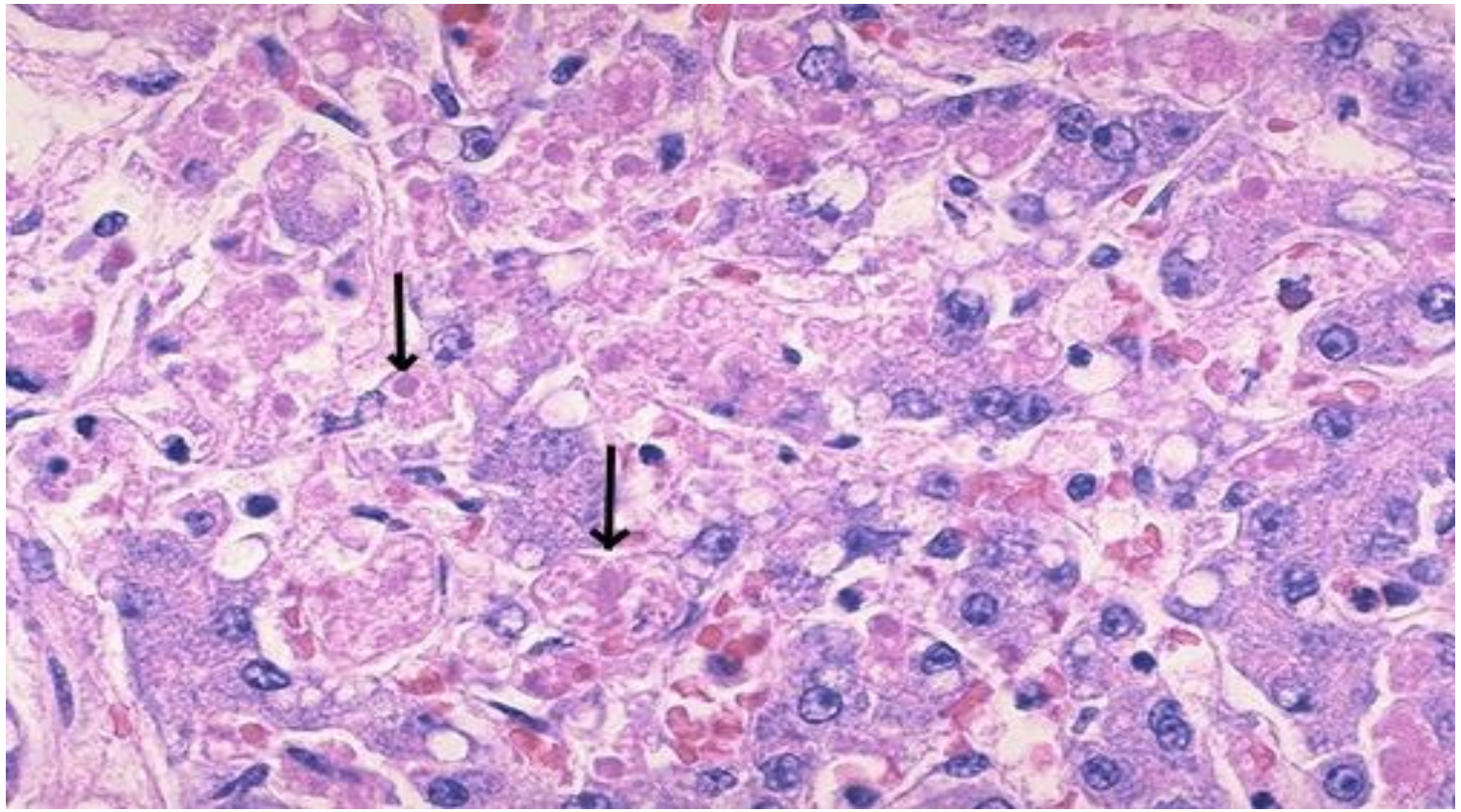
- There is loss of homogeneity, as seen by the color changes: pale areas with darker surrounding regions. This is due to the presence of fibrosis. There is also some nodule formation.

Chronic hepatitis



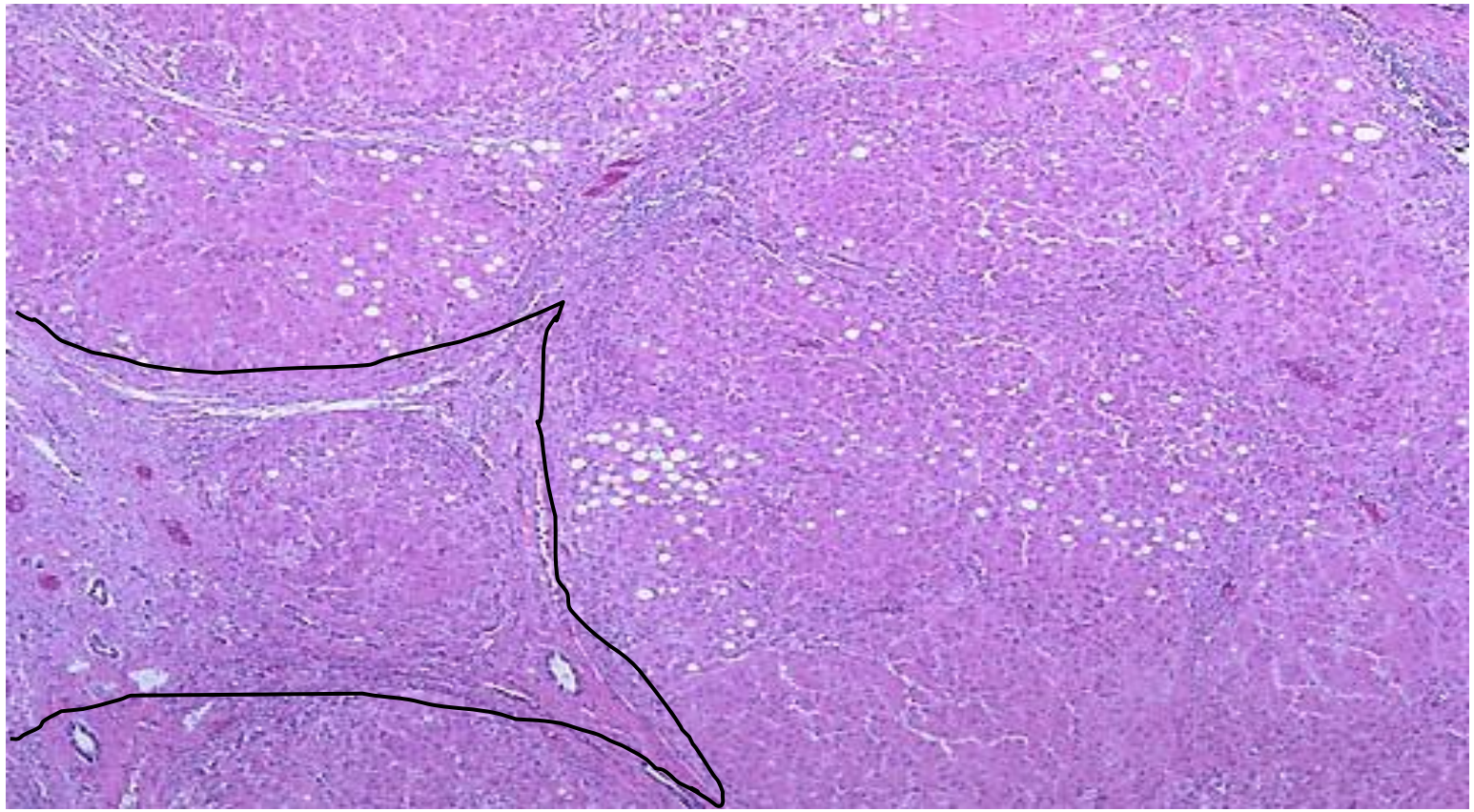
- This is the microscopic appearance of a severe form of chronic hepatitis. There are some **bridging fibrosis**, which is an indication of cirrhosis development, along with extensive lymphocytic infiltration.

Hepatic necrosis



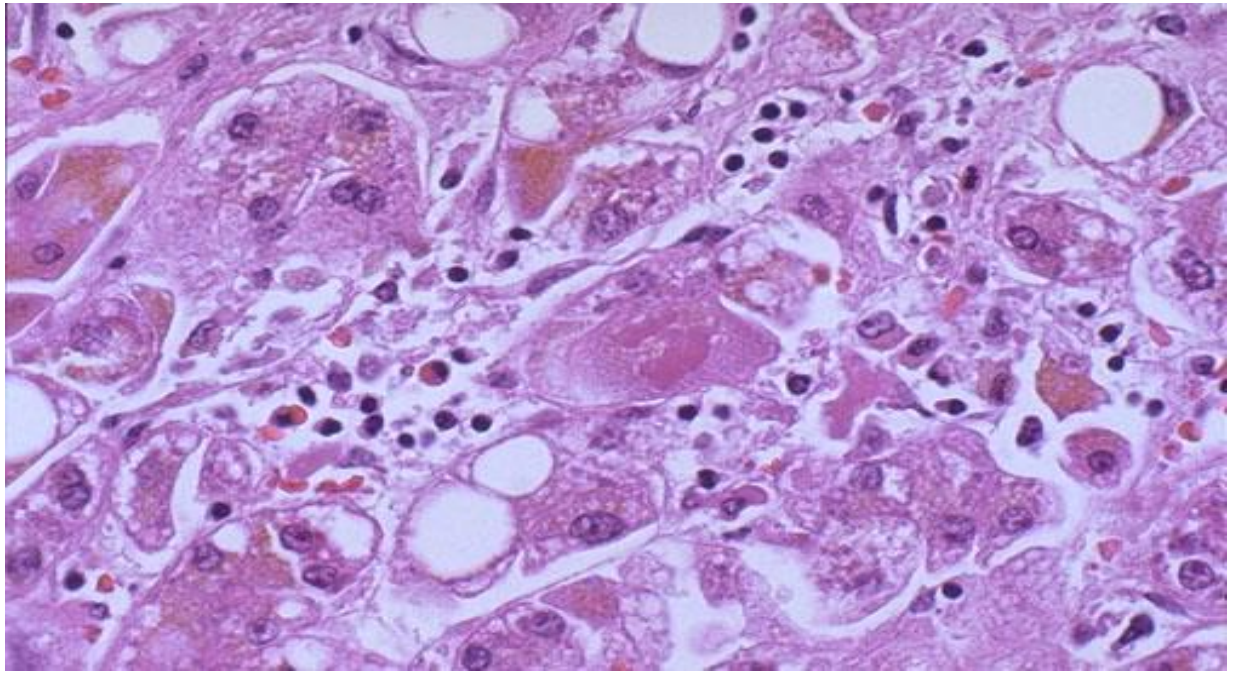
- This image displays hepatocyte necrosis, indicated by the presence of Councilman bodies (highlighted by arrows). Additionally, it demonstrates fibrosis and features consistent with chronic hepatitis.

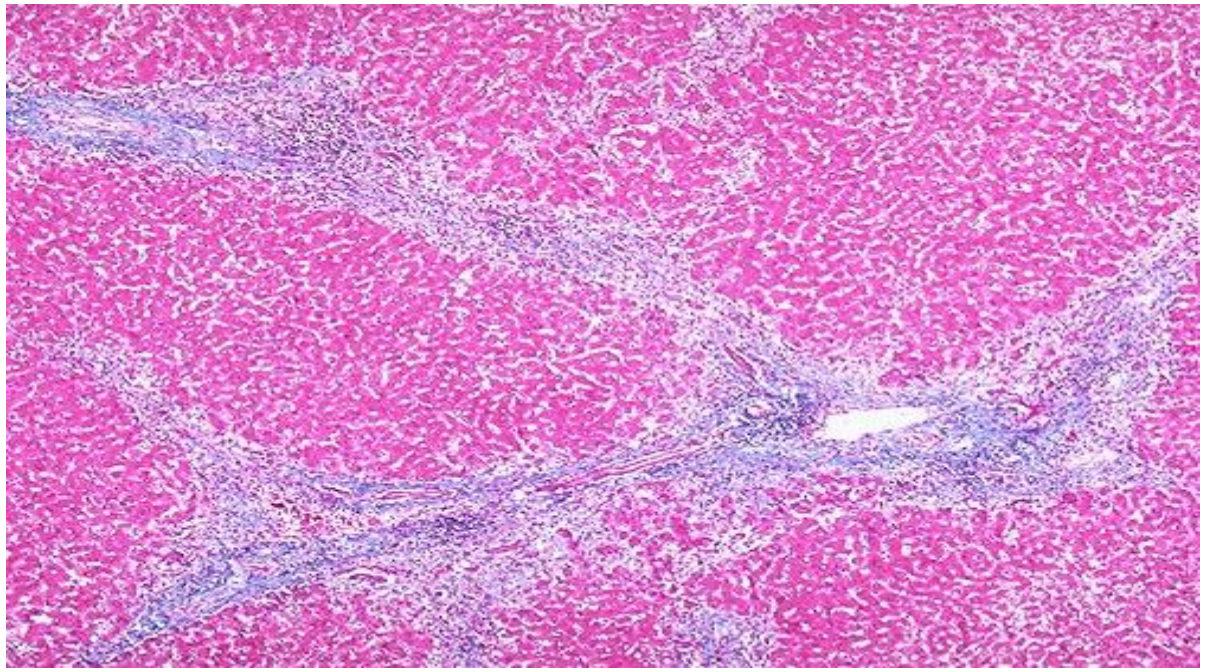
Fibrosis



1. Fat deposition
2. Presence of nodules
3. Bridging fibrosis (connecting different structures)

- This image indicates extensive fibrosis; however, it does not represent cirrhosis, as there is no formation of complete regenerative nodules.





- There is a noticeable loss of the normal hepatocyte architecture along with collapse of the liver parenchyma. This is associated with viral hepatitis, and fibrous tissue is also present on top of the damaged areas.

THE END

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