

Liver Disease

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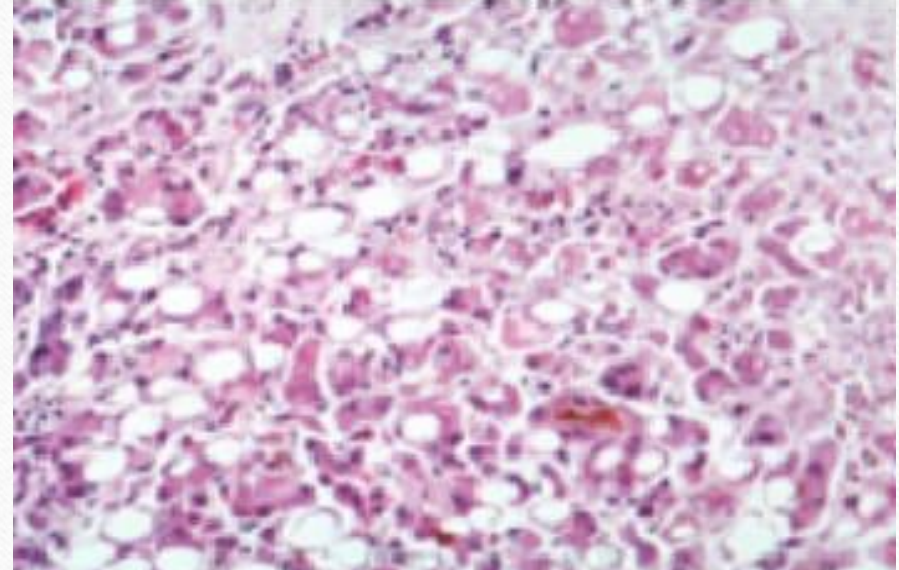
Alcoholic Liver Disease

- Three ways alcohol (ethanol) can damage liver
 - #1: Alcoholic fatty liver disease
 - #2: Acute hepatitis
 - #3: Cirrhosis

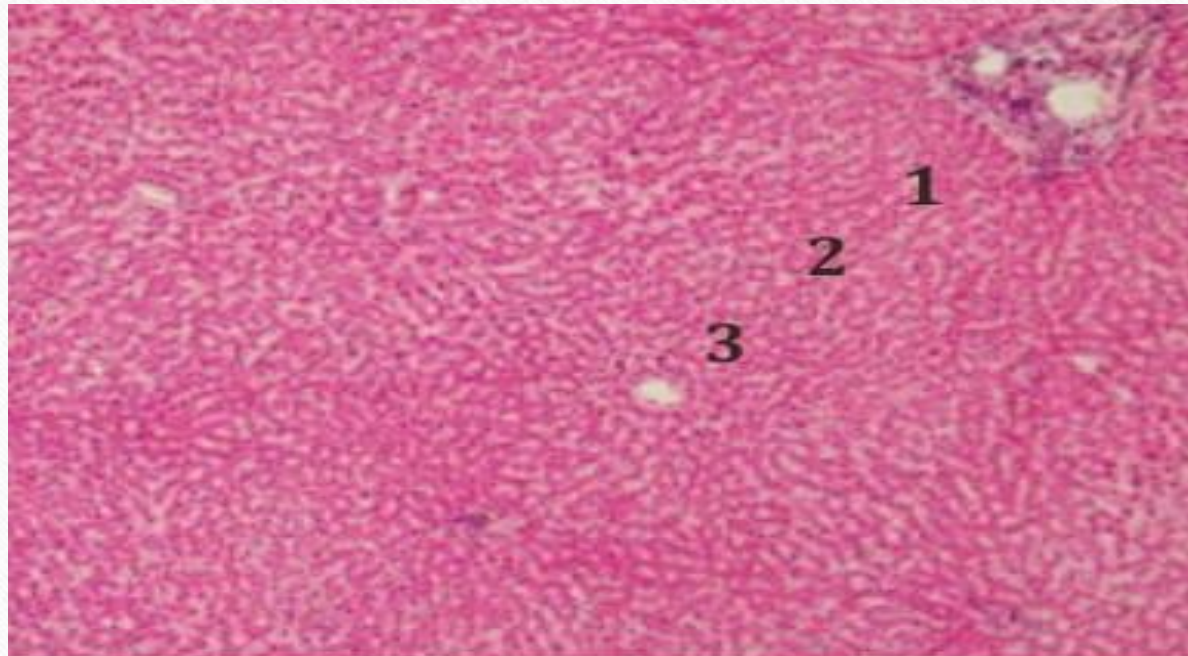


Alcoholic Fatty Liver Disease

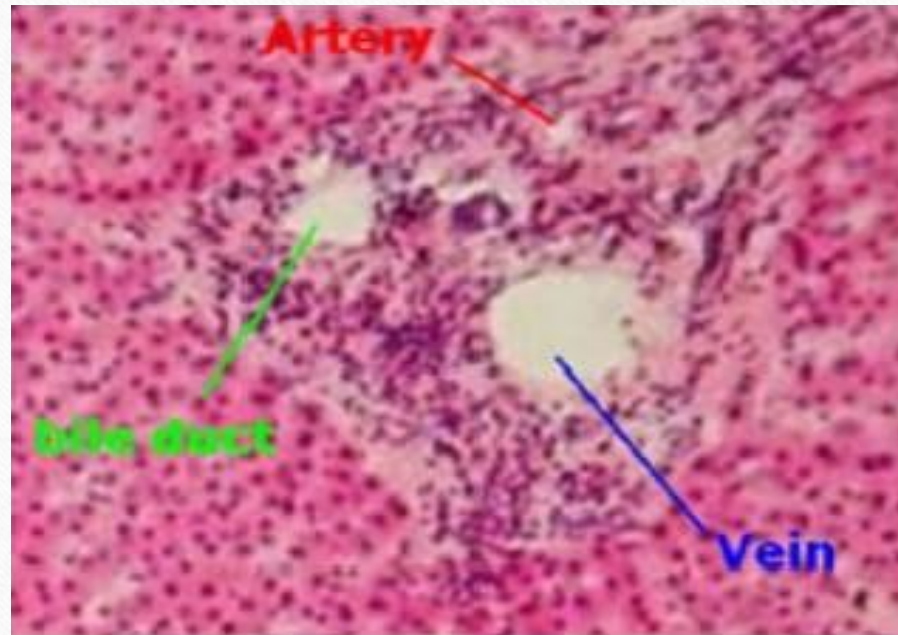
- Accumulation of **fatty acids** (fatty infiltration of liver)
- Usually asymptomatic among heavy drinkers
- May cause hepatomegaly on exam
- Abnormal LFTs (**AST>ALT**)
- Often reversible with cessation of alcohol
- ↑ risk of cirrhosis



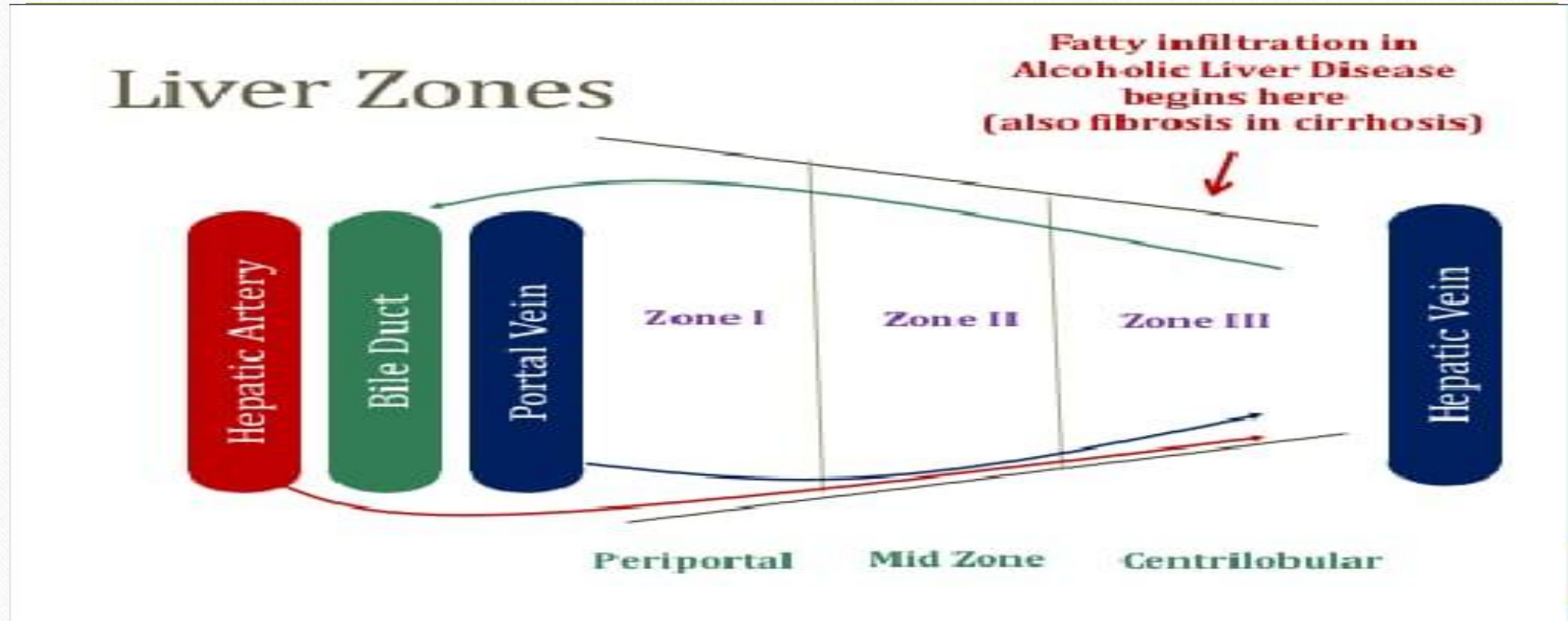
Liver Lobules



Portal Triad



Liver Zones



NAFLD

Non-alcoholic Fatty Liver Disease

- Fatty infiltration of liver not due to alcohol
 - NAFL: Fatty liver
 - NASH: Steatohepatitis (fat and inflammation)
- Often asymptomatic
- Abnormal LFTs (**ALT>AST**)
- May progress to cirrhosis
 - Associated with **obesity**
- May improve with weight loss

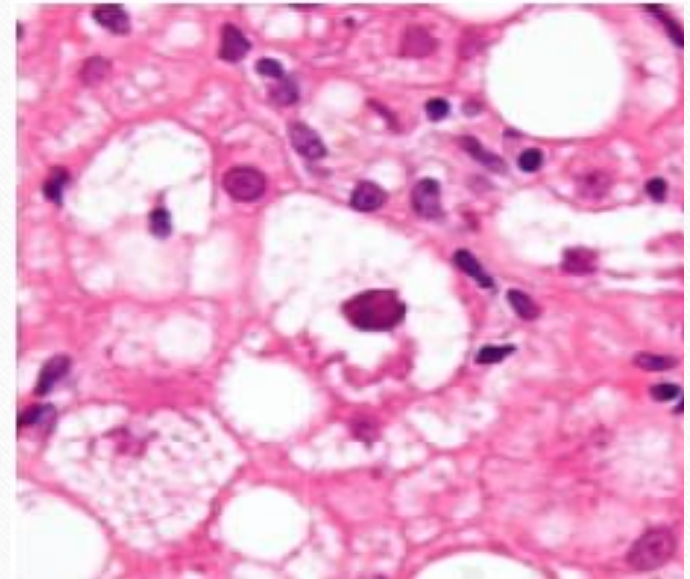
Alcoholic Hepatitis

- Classically occurs after heavy, binge drinking on top of long history of alcohol consumption
- Toxic effects from **acetaldehyde**
- Symptoms
 - Fever
 - Jaundice
 - RUQ pain/tenderness



Mallory bodies

- Classic histopathology finding alcoholic liver disease
- Cytoplasmic inclusions
- Damaged **intermediate filaments** in hepatocytes



Budd Chiari Syndrome

- Thrombosis of hepatic vein
- Abdominal pain, ascites, hepatomegaly
- **Zone 3** congestion, necrosis, hemorrhage
- Common causes:
 - Myeloproliferative disorder (P. vera, ET, CML)
 - Hepatocellular carcinoma
 - OCP/Pregnancy
 - Hypercoagulable states

Right Heart Failure

- “Cardiac cirrhosis”
- Rare cause of liver failure
- Chronic liver edema → cirrhosis
- Results in **nutmeg liver**
- Mottled liver like a nutmeg
- Also seen Budd Chiari



Reye's Syndrome

- Rare cause of liver failure and **encephalopathy**
- Children with viral infections who take aspirin
 - Classically chicken pox (**varicella zoster**) and influenza B
- Rapid, severe liver failure
 - Evidence that **aspirin inhibits beta oxidation**
 - Mitochondrial damage seen
 - Fatty changes in liver (hepatomegaly)
 - Vomiting, coma, death
- Avoid aspirin in children (except Kawasaki's)

α 1 Anti-trypsin Deficiency

- Inherited (autosomal **co-dominant**)
- Decreased or dysfunctional AAT
- AAT balances naturally occurring proteases

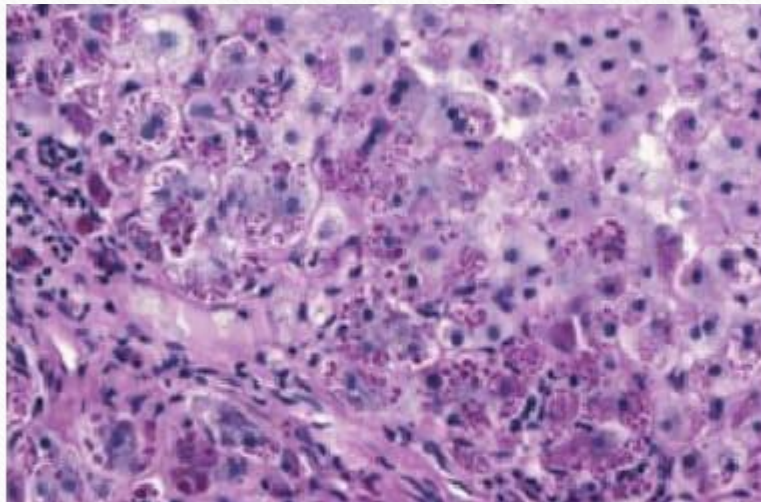


α 1 Anti-trypsin Deficiency

- Lung
 - **Emphysema**
 - Imbalance between neutrophil elastase (destroys elastin) and elastase inhibitor AAT (protects elastin)
- Liver
 - **Cirrhosis**
 - Abnormal α 1 builds up in liver (endoplasmic reticulum)
 - Pathologic polymerization of AAT
 - Occurs in endoplasmic reticulum of hepatocytes

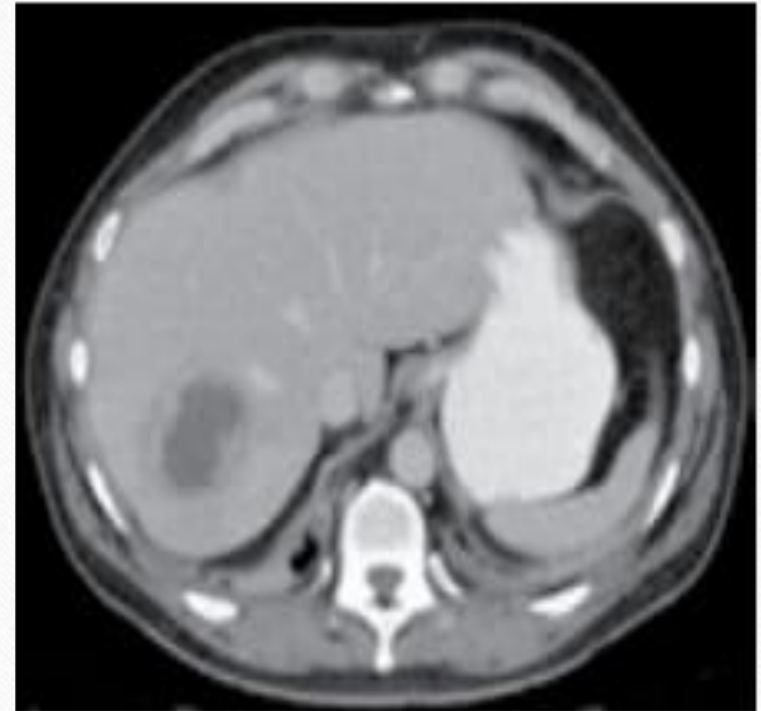
α 1 Anti-trypsin Deficiency

- AAT polymers **stain with PAS**
- Resist **resist digestion by diastase** (unlike glycogen)



Liver Abscess

- Walled-off infection of the liver
- In the US usually bacteria
 - Bacteremia
 - Cholangitis (GN Rods; Klebsiella often identified)
- **Entamoeba histolytica** (protozoa)
 - Cysts in contaminated water → bloody diarrhea (dysentery)
 - Ascends in the biliary tree
- **Echinococcus** (helminth)
 - Fecal-oral ingestion of eggs
 - Massive liver cysts



Viral Hepatitis

- Hepatitis A, B, C, D, or E
- Very high AST/ALT
 - Often >1000 ($>25\times$ normal)
- Hyperbilirubinemia and jaundice
- If severe, may see abnormal synthetic function
 - Hypoglycemia, elevated PT/PTT, low albumin
- Diagnosed via viral antibody tests

Autoimmune Hepatitis

- Autoimmune inflammation of the liver
- Most common among women in 40s/50s
- Range of symptoms
 - Asymptomatic → acute liver disease → cirrhosis
- Anti-nuclear antibodies (ANAs)
 - Most common antibody abnormality
 - Sensitive, not specific
- **Anti-smooth muscle antibodies (ASMA)**
 - More specific for AHA
- Treatment: steroids and immunosuppressants

Shock Liver

Ischemic Hepatitis

- Diffuse liver injury from **hypoperfusion**
- Often seen in ICU patients with shock from any cause
- Markedly elevated AST/ALT (1000s)
- Usually self-limited
- Pathology: **zone 3 necrosis** (near central vein)