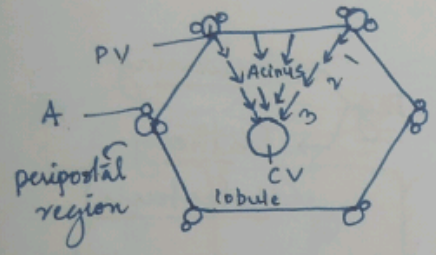
Liver and Biliary System

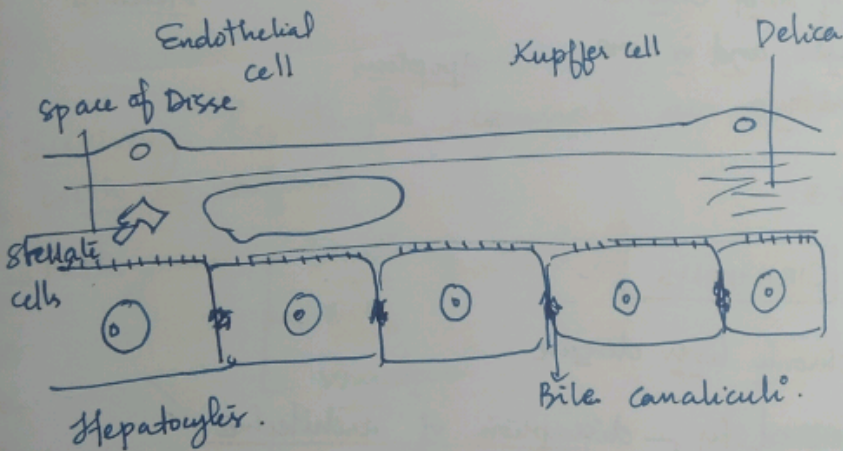
- Wt : 1400 to 1600 gm (2.5 % BW)
- Blood supply - Dual → PV - 60-70%, HA - 30-40% } Porta hepatis.
- Microarchitecture - 2 concepts.



3 → less vascularized (ischemic injury more common)
2 →
1 → highly vascularized area

- Normally in a liver there is No fibrous tissue.

Sinusoid.



DISEASES.

1°
- Viral Hepatitis
- Alcoholic liver dis
- NAFLD
- Cirrhosis
- HCC

2°
- Cardiac decompensation
- disseminated cancer

Laboratory Evaluation of Liver disease.

- Hepatocyte Integrity. — AST, ALT, LDH
- Biliary secretory fn. — Serum bilirubin.
- Hepatocyte function.

Patterns of Liver injury.

- Degeneration & intracellular accumulation
  - Deg. → Ballooning
  - Deg. → Feathery (Cholestasis)
  - Intracellular accumulation (fatty) → microvesicular steatosis
  - Intracellular accumulation (fatty) → macrovesicular steatosis
- Necrosis & Apoptosis
  - Apoptosis
- Inflammation
  - portal triads (early)
  - sinusoids (more severe)
- Regeneration
- Fibrosis.
  - ↳ end stage of most chronic liver diseases, and is one absolute criteria.

SLO: PA 25.4 & 25.5.

CIRRHOSIS

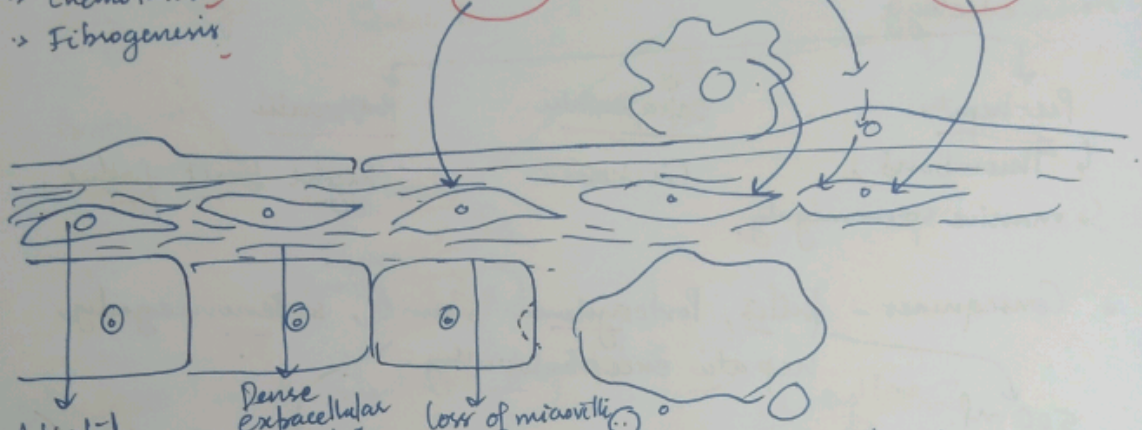
- End stage of chronic liver disease.
  - characterised by
    - disruption of architecture
    - Parenchymal nodules
    - Bridging fibrous septae
- Classification - Based on both (M&E)
  - Morphological (size)
    - micronodular - < 3 mm → alcoholic liver disease
    - macronodular
    - mixed
    - > 3 m
    - chronic hepatitis
  - Etiological
    - chronic Hepatitis B & C
    - Alcoholic abuse
    - NASH
    - Autoimmune disorder
    - Biliary dis
    - Hemochromatosis
    - Metabolic - Wilson's disease
    - Drugs and toxins

Activated stellate cells.

"Myofibroblasts" ✓
→ Proliferation
→ Contraction
→ Chemotaxis
→ Fibrogenesis

Activated Kupffer cell release cytokines that promote:

Proliferation: PDGF, TNF
Contraction: ET-1
Chemotaxis: MCP-1, PDGF



CIVER FIBROSIS

Surviving hepatocytes regenerate as spherical nodules with in confined

→ Pathogenesis
- Death of hepatocytes
- ECM
- vasular

→ Stimulus
- → Chronic inflammation.
- → Kupffer cells
- → Disruption of ECM

6) Spider angiomas
7) Hypogonadism.

CF → non-specific anorexia wt loss, weakness
→ Signs of hepatic failure.
1) Jaundice
2) Hypoalbuminemia
3) Hyperammonemia
4) Hypoglycemia
5) Palmar erythema.

∴ ..

Portal Hypertension

- Resistance of portal blood flow
- ↑ portal flow due to hyperdynamic circulation
- Etiology

Pre-hepatic
↳ Thrombosis
↳ massive splenomegaly

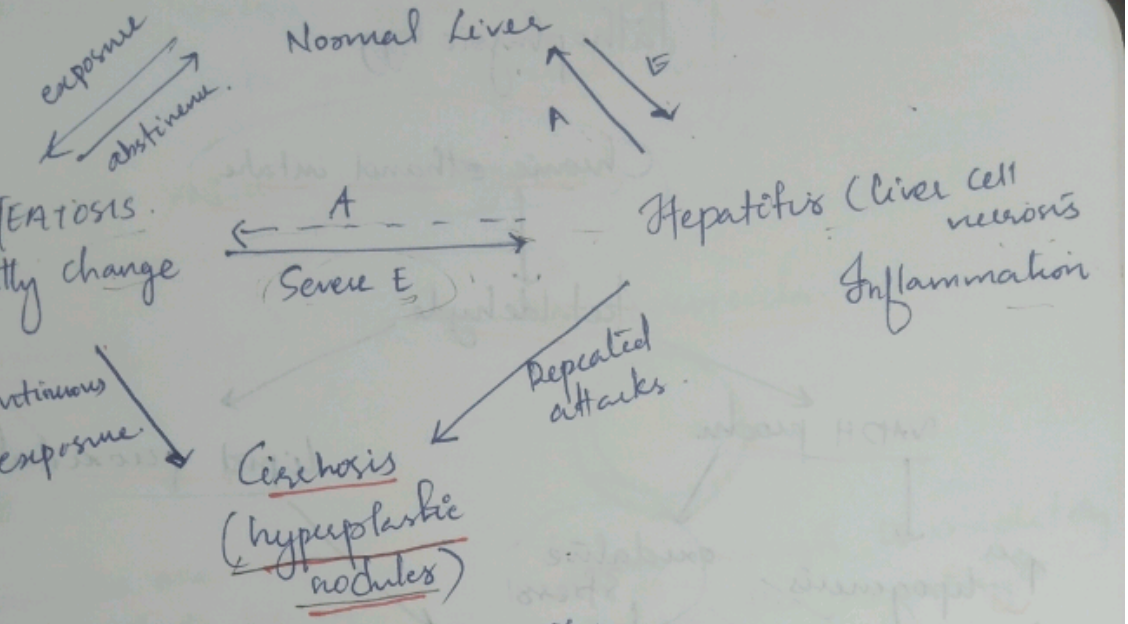
Intrahepatic
Cirrhosis

Post Hepatic
Right heart failure.

- Consequences – Ascites, Portosystemic shunts, splenomegaly, hepatic encephalopathy
  - ascites → 500 ml.
  - portosystemic shunts → haemorrhoids, oesophageal varices, caput medusa

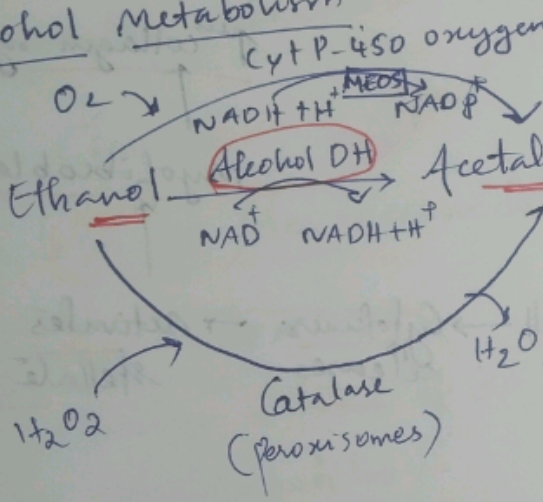
Alcoholic Liver Disease

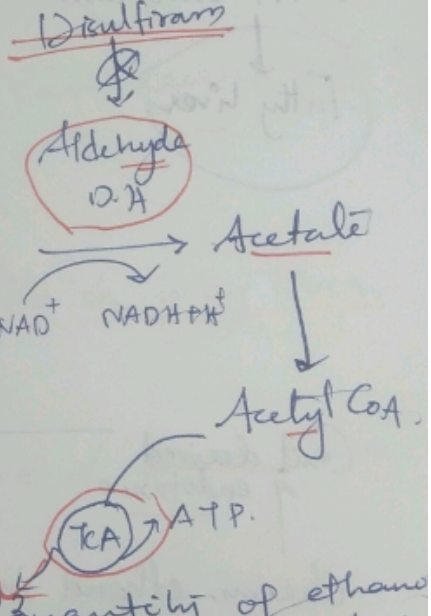
- C/C disorder
- 3 stages – Alcoholic steatosis
  - Alcoholic steatohepatitis
  - fibrosis & cirrhosis.
- 90-100% of heavy drinkers develop fatty liver (steatosis)
- 15-30% develops into liver cirrhosis
- 10-20% of alcoholic LC. leads to HCC.



- Steatosis and alcoholic hepatitis

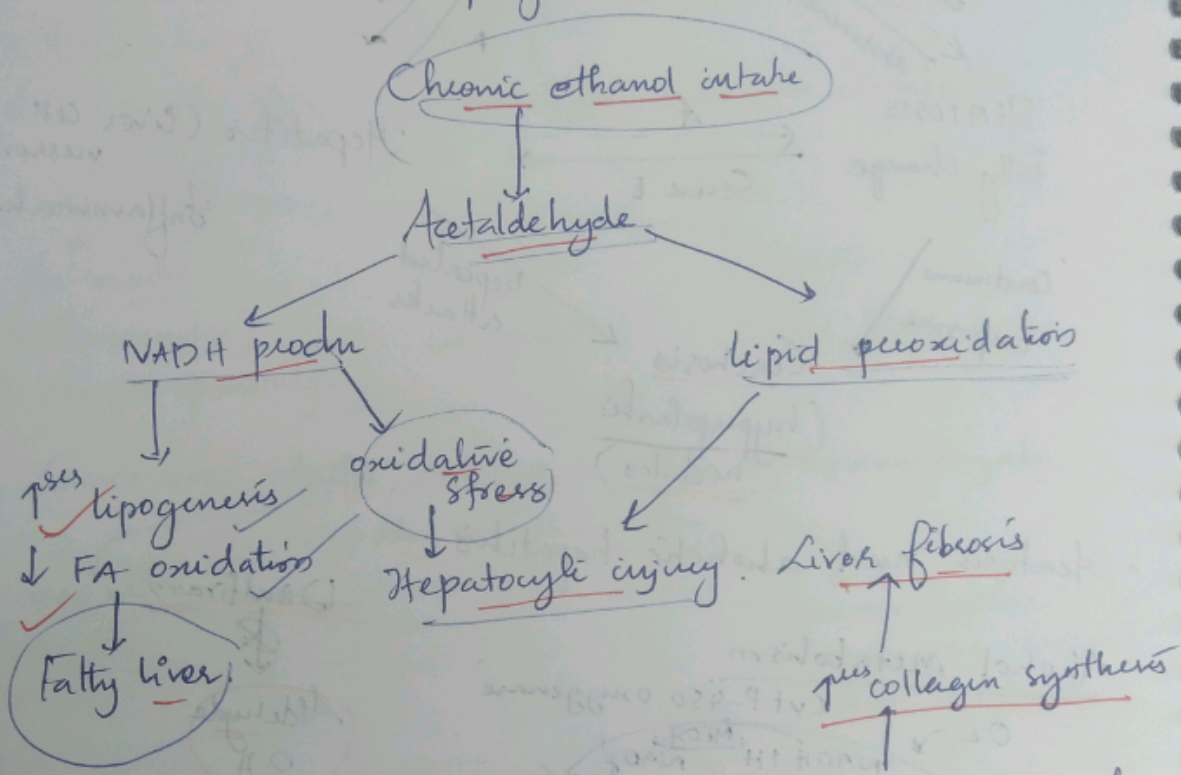
Alcohol Metabolism





Risk factors – Drinking pattern – quantity of ethanol drunk
– Gender – females (hormone: oestrogen)
– Genetic factors – microsomal p450 oxidase
alcohol dh
– Concurrent Hep B & C.

Pathophysiology



Pathogenesis

- Direct hepatotoxicity by ethanol
- By ethanol metabolites
- Oxidative stress
- Cytokines - TNF, IL1, IL6

STEATOSIS :- short term ingestion of 80 gm of alcohol over one to several days.

Gross
large soft yellow greasy organ

Microvesicular

Fat vacuoles are small enough to lie in the cytoplasm of hepatocytes

Macrovesicular

large enough to completely replace the hepatocyte cytoplasm

→ Completely reversible; abstinence can revert back the changes.

Fatty Change

↳ Triglycerides accumulates results in fatty liver.

ALCOHOLIC HEPATITIS

- Daily intake of 80 g or more / 160 or more
- Steatohepatitis
- swelling & necrosis - fat & Mallory bodies - cytokeratin 8 & 18 with ubiquitin.
  - eosinophilic cytoplasmic clumps
- Characteristic but not specific
- Masson trichrome (highlighted)
- Neutrophilic infiltrate.