

Jaundice

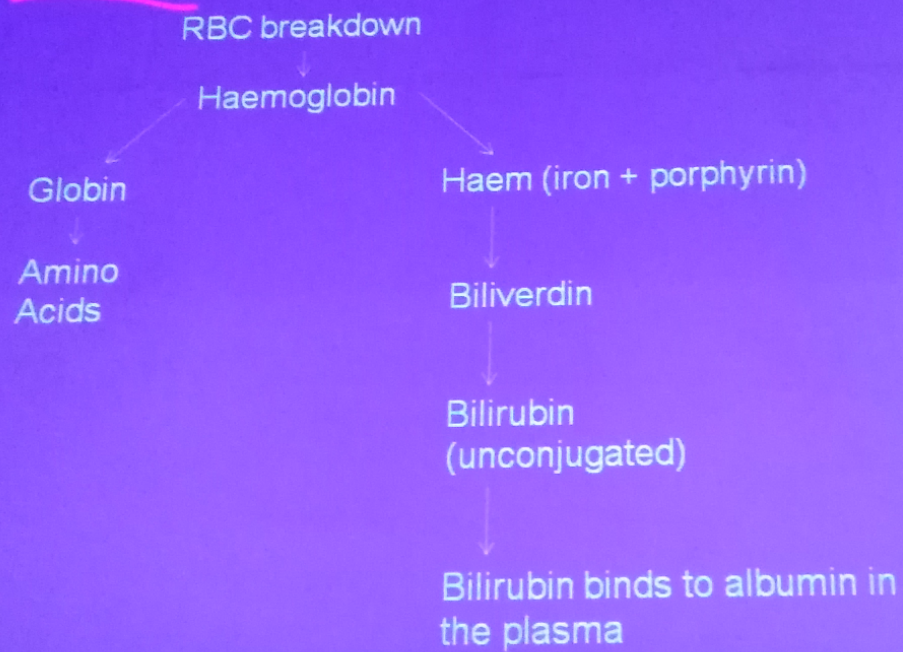
Definition: yellow discolouration of skin and sclera due to hyperbilirubinaemia

Bilirubin $>35\text{mmol/L}$ for jaundice to be visible on examination.

Sclera first place to become jaundiced.

Haemoglobin Metabolism

- Bilirubin is a product of metabolism of haemoglobin (80%) and other haem containing proteins (e.g. Myoglobin, cytochrome P450: 20%)
- Degredation of haemoglobin into bilirubin takes place in macrophages. Bilirubin is then excreted into plasma and binds with albumin



Classification of Jaundice

Pre-hepatic: pathology occurring prior to the liver

- increased haemolysis (e.g. Spherocytosis, thalassaemia, sickle cell disease, transfusion reaction, auto-immune, malaria etc.) and some drugs
- unconjugated hyperbilirubinaemia

Intra-Hepatic: pathology occurring within the liver

- hepatitis/cirrhosis (e.g. Alcohol, viral, auto-immune, primary biliary cirrhosis, haemochromatosis, Wilson's, alpha-1 antitrypsin deficiency etc.), inherited conditions and some drugs
- hepatocyte destruction and unconjugated hyperbilirubinaemia or in bile canaliculi destruction and conjugated hyperbilirubinaemia or both

Post-hepatic: pathology occurring after conjugation of bilirubin within the liver .

Any cause of biliary obstruction.

Causes conjugated hyperbilirubinaemia

Causes of Jaundice

| Type | Cause | Clinical example | Frequency |
|--------------|--------------------------------------|---|--|
| Prehepatic | hemolysis | autoimmune abnormal hemoglobin | uncommon depends on region |
| intrahepatic | infection | hepatitis A, B, C | common/very common |
| | chemical/drug | acetaminophen alcohol | common common |
| | genetic errors: bilirubin metabolism | Gilbert's syndrome Crigler-Najjar syndrome Dubin-Johnson syndrome Rotor's syndrome | 1 in 20 very rare very rare very rare |
| | genetic errors: specific proteins | Wilson's disease α_1 antitrypsin | 1 in 200 000 1 in 1000 with genotype |
| | autoimmune | chronic active hepatitis | uncommon/ rare |
| | neonatal | physiologic | very common |
| Posthepatic | intrahepatic bile ducts | drugs primary biliary cirrhosis cholangitis | common uncommon common |
| | extrahepatic bile ducts | gall stones pancreatic tumor cholangiocarcinoma | very common uncommon rare |

History

- How long been jaundiced?
- Ever been jaundiced before?
- Any associated fevers or abdominal pain or weight loss?
- Pale stool and dark urine .
- Any recent foreign travel ?
- Any risk factors for hepatitis (tattoos, IVDU, high risk professions, blood transfusions, multiple sexual partners)?
- PMH. blood disorders (SCD, thalassemia)?
- DH. any new medications that can cause jaundice?
- SH. excess alcohol intake
- FH. jaundice (inherited disorders of bilirubin metabolism)

Obstructive Jaundice

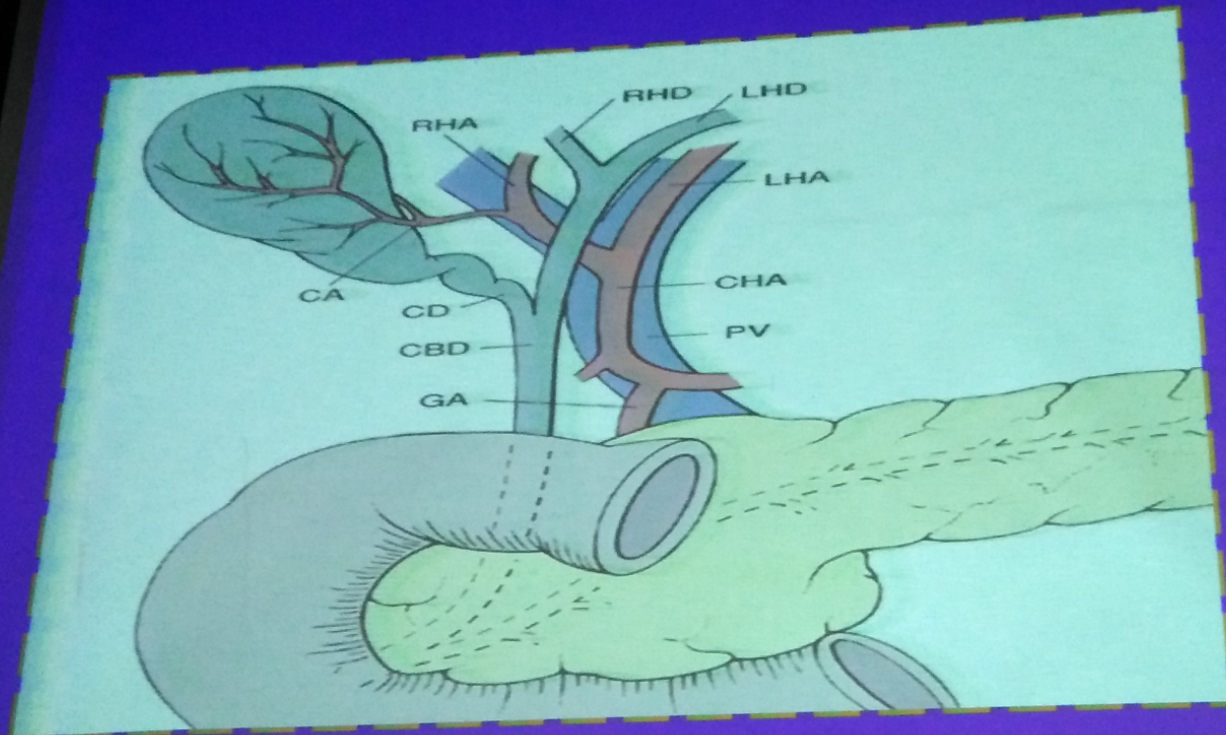
Causes

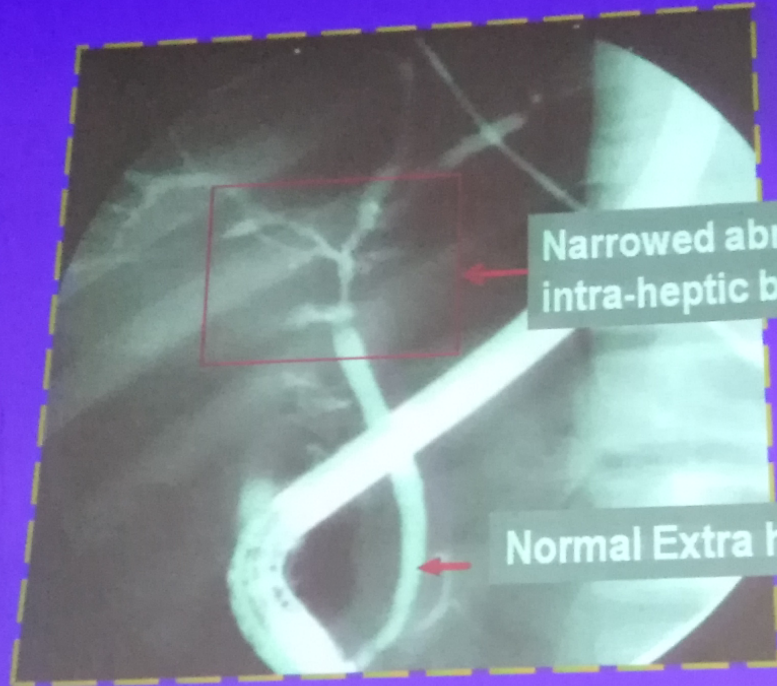
- Luminal
 - » **Gallstone**
- Intra-mural
 - » Benign stricture (complication of cholecystectomy or due to pancreatitis)
 - » Malignant stricture: cholangiocarcinoma
- Extra-mural
 - » **Head of pancreas cancer**
 - » Pancreatitis (oedema of head of pancreas)
 - » Pancreatic pseudocyst
 - » Compression by malignant lymph nodes at porta hepatis

Obstructive Jaundice

Choledocholithiasis vs. tumor

- Clinical features favoring CBD stones:
 - Age < 45
 - Biliary colic
 - Fever
 - Transient spike in AST or amylase
- Clinical features favoring cancer:
 - Painless jaundice
 - Weight loss
 - Palpable gallbladder
 - Bilirubin > 10





Narrowed abnormal
intra-heptic bile ducts.

Normal Extra hepatic BD

ERCP



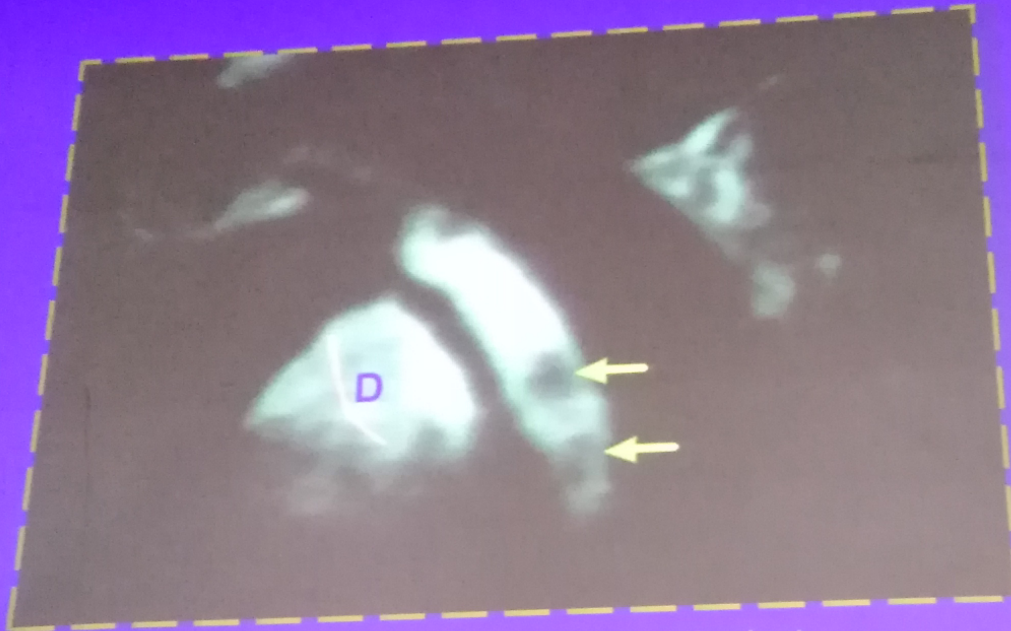
Irregular dilation of intrahepatic and extrahepatic ducts..

ERCP



Bile leak from the cystic duct after cholecystectomy

MRCP



Two stones in the common bile duct

Diagnosis of Jaundice

| Features | Prehepatic (Hemolytic) | Intrahepatic (Hepatocellular) | Posthepatic (Obstructive) |
|---------------------------|---------------------------|----------------------------------|------------------------------|
| Unconjugated | ↑ | Normal | Normal |
| Conjugated | Normal | ↑ | ↑ |
| AST or ALT | Normal | ↑ ↑ | Normal |
| Alkaline phos. and GGT | Normal | Normal | ↑ ↑ |
| Urine bilirubin | Absent | Present | Increased |
| Urobilinogen | Increased | Present | Absent |

Drug-induced Liver Disease

- **Hepatocellular**
 - acetaminophen, INH, methyldopa, MTX
- **Cholestatic**
 - chlorpromazine, estradiol, antibiotics
- **Chronic Hepatitis**
 - methyldopa, phenytoin, macrodantin, PTU
- **Hypersensitivity Reaction**
 - Phenytoin, Augmentin, allopurinol
- **Microvesicular Steatosis**
 - amiodarone, IV tetracycline, AZT, ddl, stavudine

Critical questions in the evaluation of jaundiced patient

- Acute vs. Chronic Liver Disease.
- Hepatocellular vs. Cholestatic
- Fever
- Encephalopathy

