Update Management Of Common Bile Duct Stones

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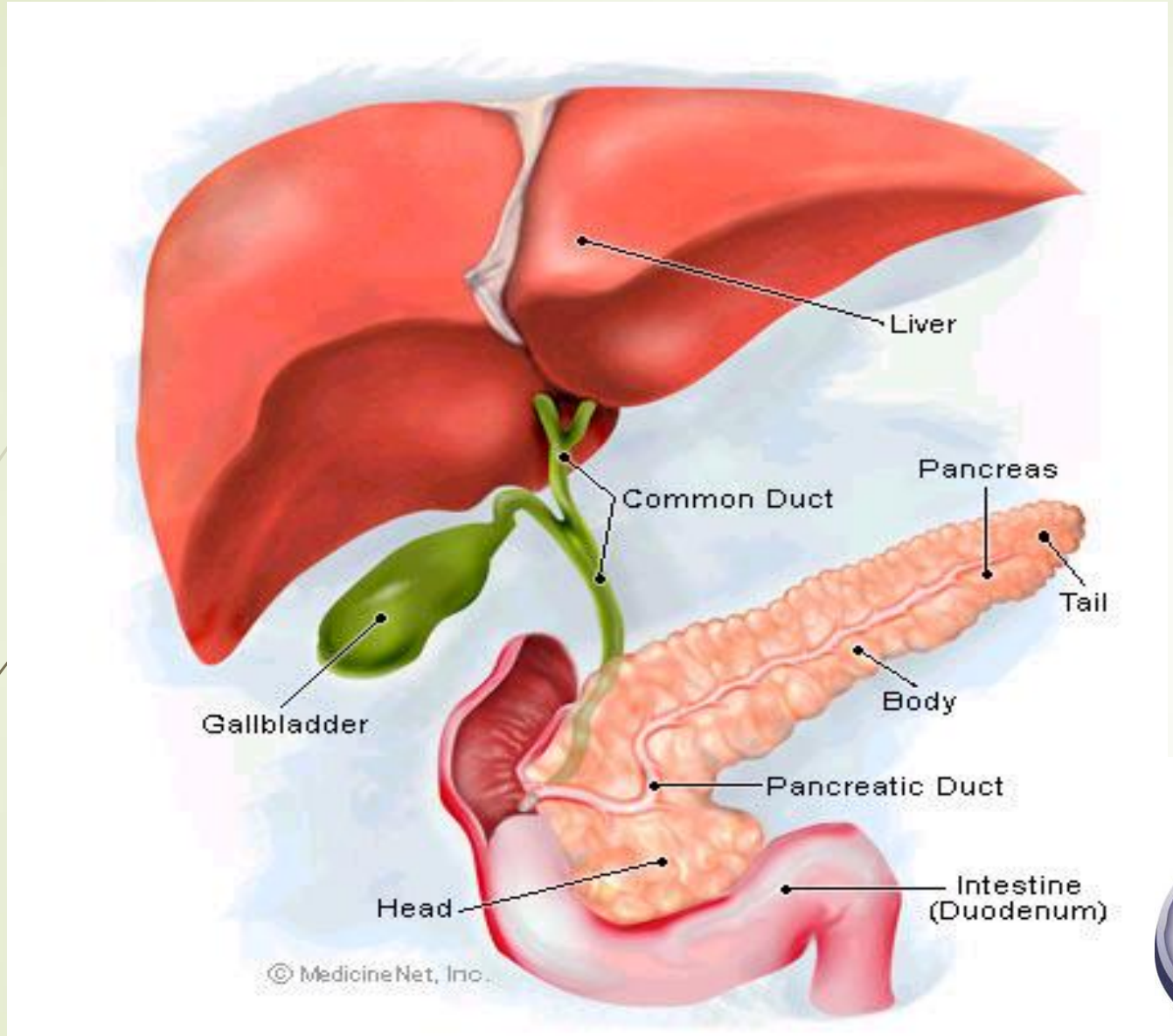


10% of Patients with Gall stones have associated CBD stones.

Etiology

Point of origin:

- Secondary (gallbladder)
- Primary (de novo within biliary tract)
- Primary CBD stones:
- South-east Asian populations
- Associated with stasis and infection
- Brown pigment type
- Soft and easy to crumble

Biliary stasis:

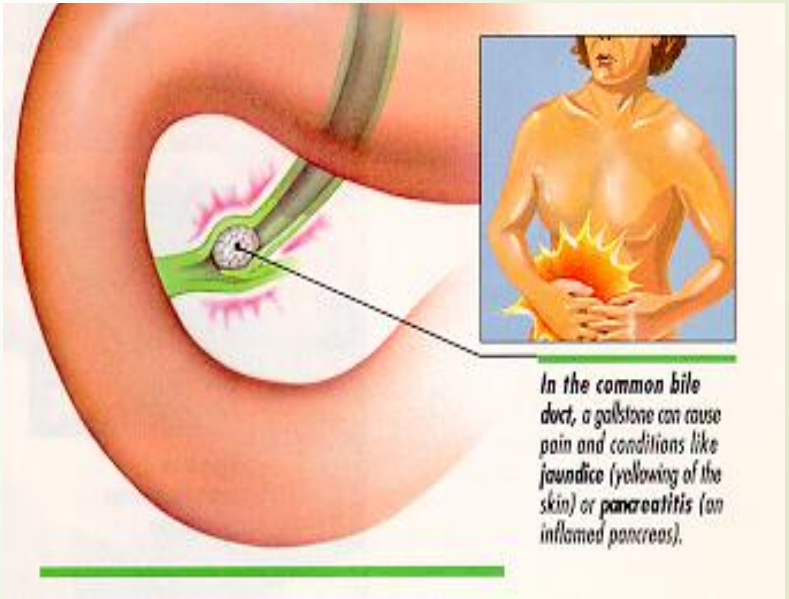
- Biliary stricture
- Papillary stenosis
- Sphincter of Oddi dysfunction

Positive biliary cultures:

- Stasis
- Bacterial glucoronidases
- DE conjugation of bilirubin diglucuronide & precipitation of bilirubin as its calcium salt

CBD Stone: Presentation

- Cholangitis
  - Charcot's triad
    - Intermittent pain
    - Intermittent fever
    - Intermittent jaundice
  - Reynold's Pentad
    - Hypotension
    - Confusion
- Obstructive Jaundice
- Pancreatitis
- Asymptomatic



Biochemical Diagnosis
Predicting factors

Liver function tests

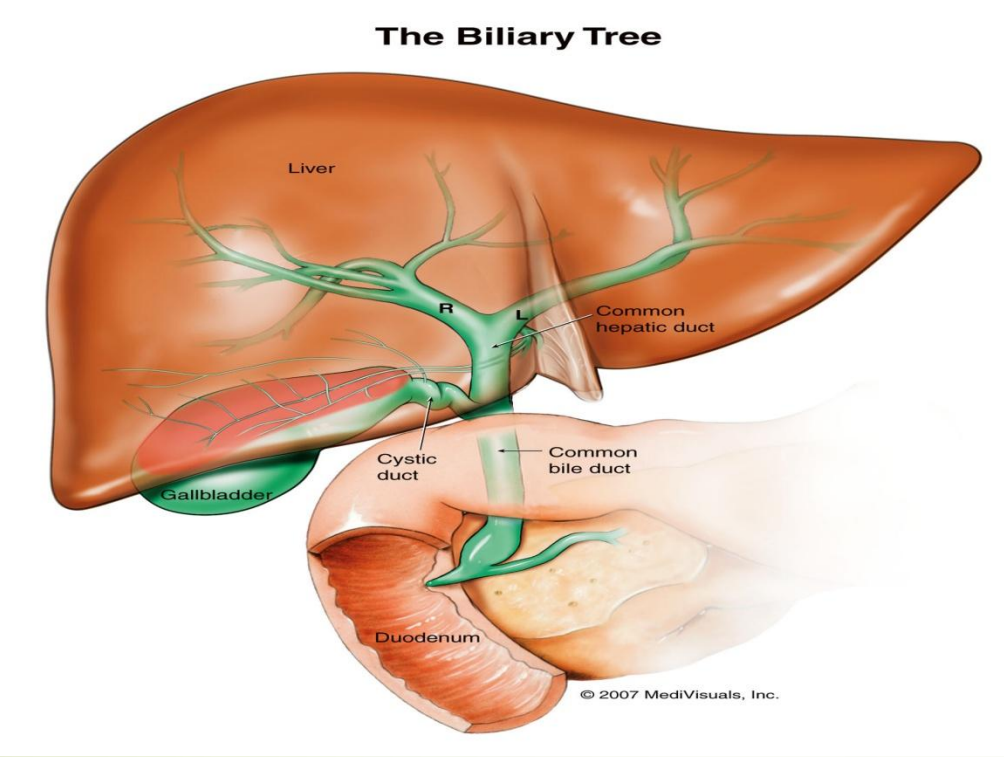
- Bilirubin >3gm .
- Alkaline phosphatase .
- Transaminases: SGOT/SGPT .
- Gamma GT .

Normal Liver profile does not exclude CBD stones

Liver Function Tests

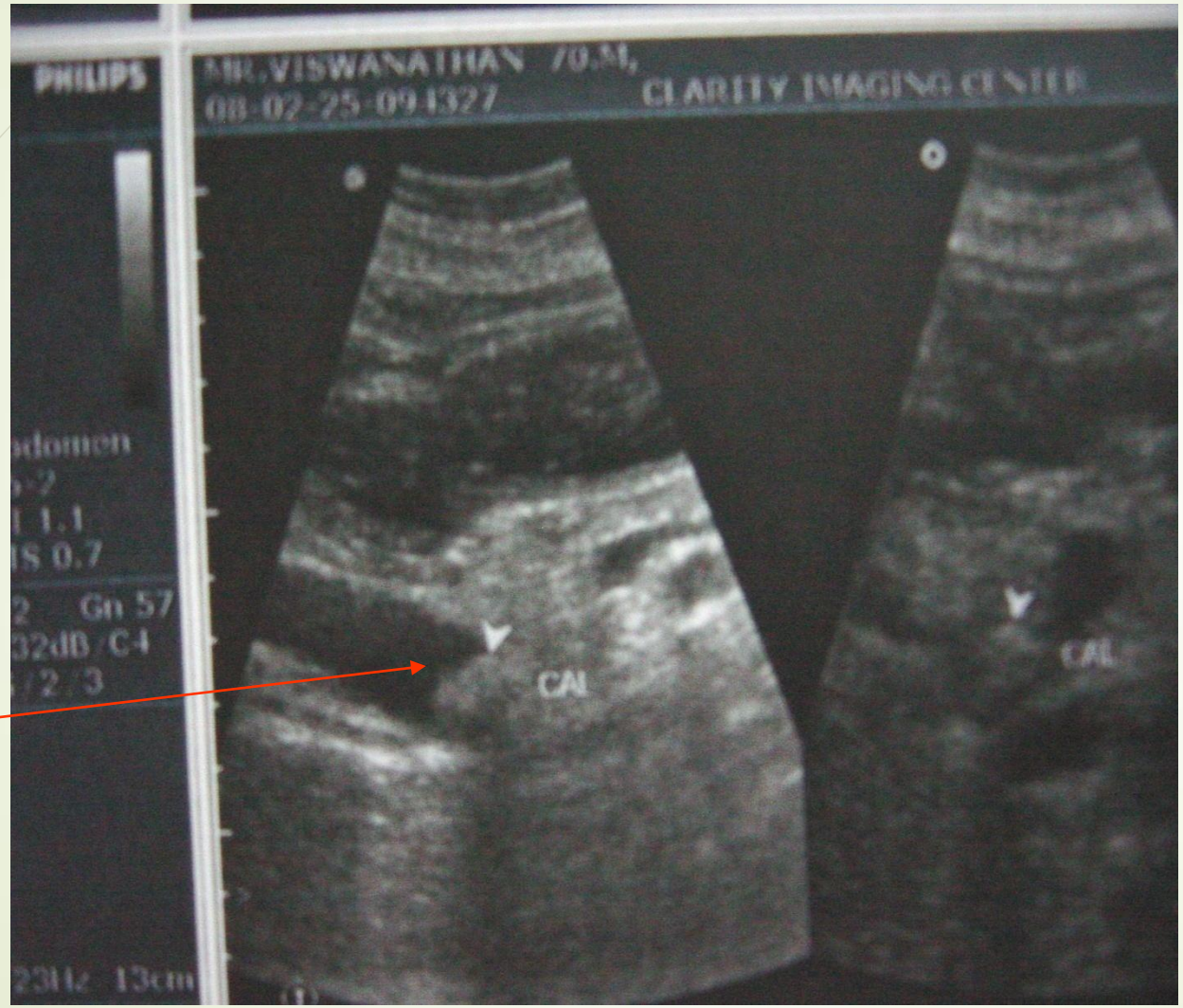
LIVER FUNCTION TESTS	INCIDENCE OF CBD STONES
NORMAL	4%
One Abnormal Value	20%
Three Abnormal Values	50%

Radiological Diagnosis



- US abdomen
- CT abdomen
- MRCP
- EUS
- ERCP

1.US abdomen



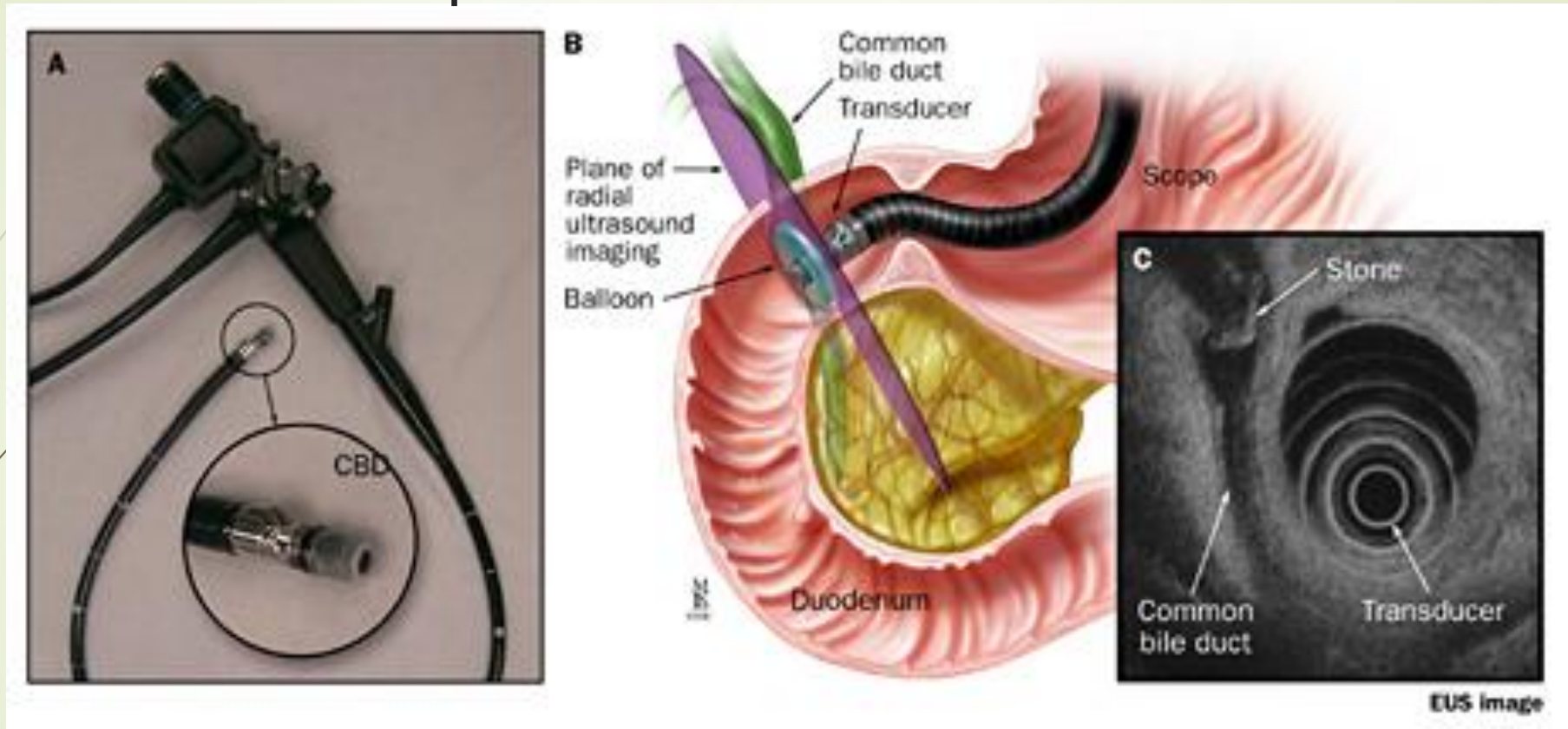
Non Invasive Diagnostic

Dilated CBD: >6mm

Low sensitivity

Normal Ultrasound can not exclude CBD stone……

2. Endoscopic US

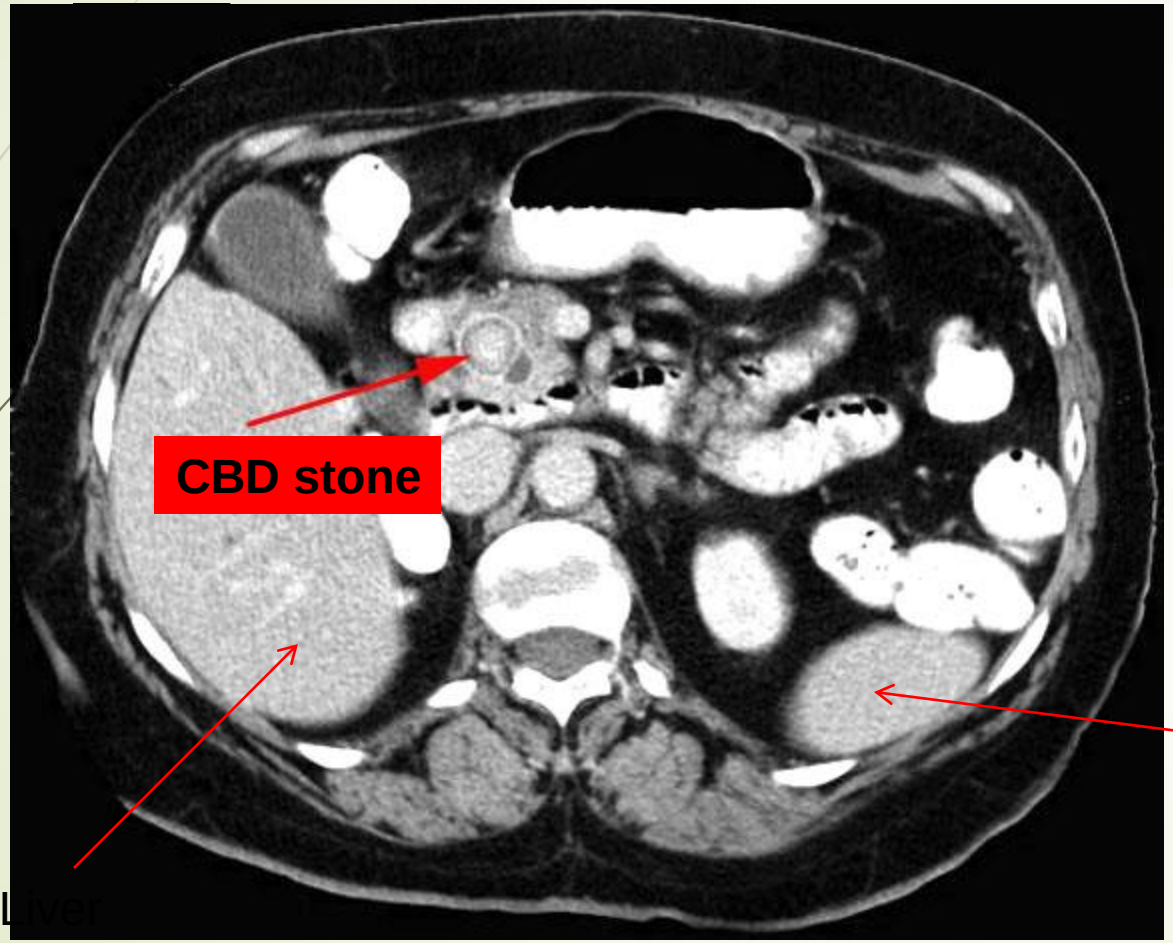


- SENSITIVITY 75%-100%
- SPECIFICITY 77%-100%

Invasive
Diagnostic

Sensitive test
But…
Operator Dependent
Availability?

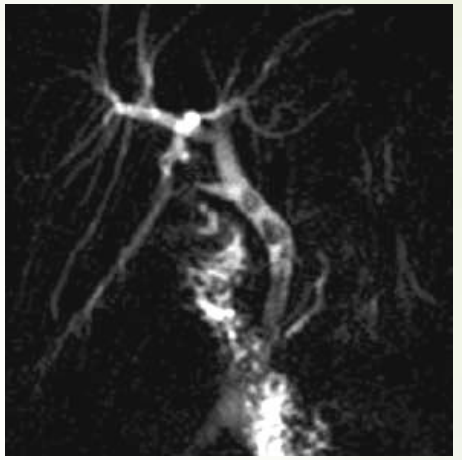
3. CT abdomen

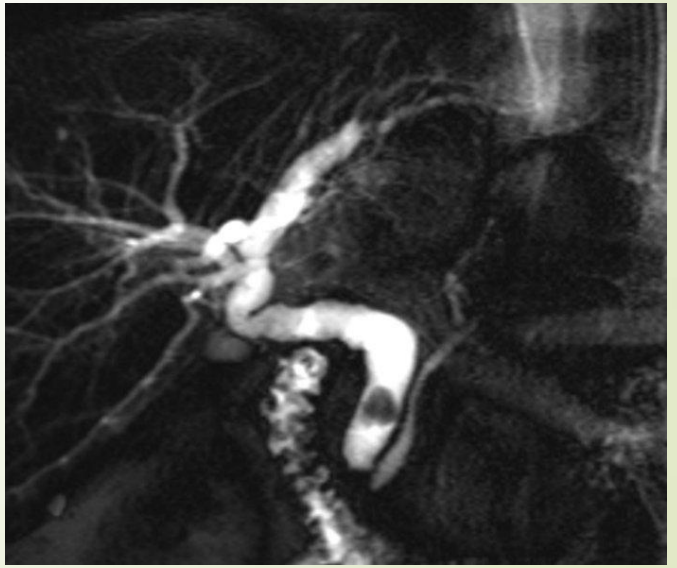


Non Invasive
Diagnostic

4. MRCP

- Sensitivity: 90%
- Specificity: 100%
- High cost
- Limited availability
- Non therapeutic

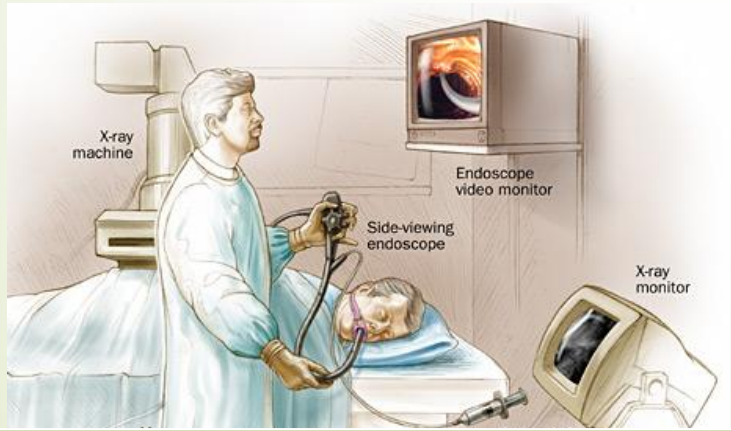




Test of Choice

5. ERCP

- Diagnostic and therapeutic
- Invasive study
- Success: 99%
- Mortality: 1%
- Morbidity: 6%
- Long term complications?



Treatment Of Choice

Invasive
Essentially Therapeutic

ERCP

Diagnostic and therapeutic

Endoscope into 2nd portion of duodenum

Papilla visualized at 12 or 1 o'clock

- Small nub across semicircular folds
- Soft reticulated area at tip = papillary orifice

Cannulation of orifice

- Fluoroscopy
- CBD orifice at 11 o'clock
- Pancreatic duct orifice at 1 to 2 o'clock

ERCP

CBD cannulation via guidewire

Sphincterotomy

- Electrosurgical division of papilla

Stone retrieval:

- Balloon sweep
- Basket
- Crushing technique

Strictures:

- Cytologic brushings
- Balloon dilation
- Stent placement

ERCP

Complications

Acinarization or rupture of small ductules

Pancreatitis: contrast extravasation into duct

Cholangitis: contrast into proximal biliary tree

Duodenal perforation:

Retroperitoneal or free intraperitoneal air → Emergency surgery ✓

Bleeding:

Epinephrine ✓

Electrocoagulation ✓

Balloon tamponade ✓

Arteriographicembolization of GDA ✓

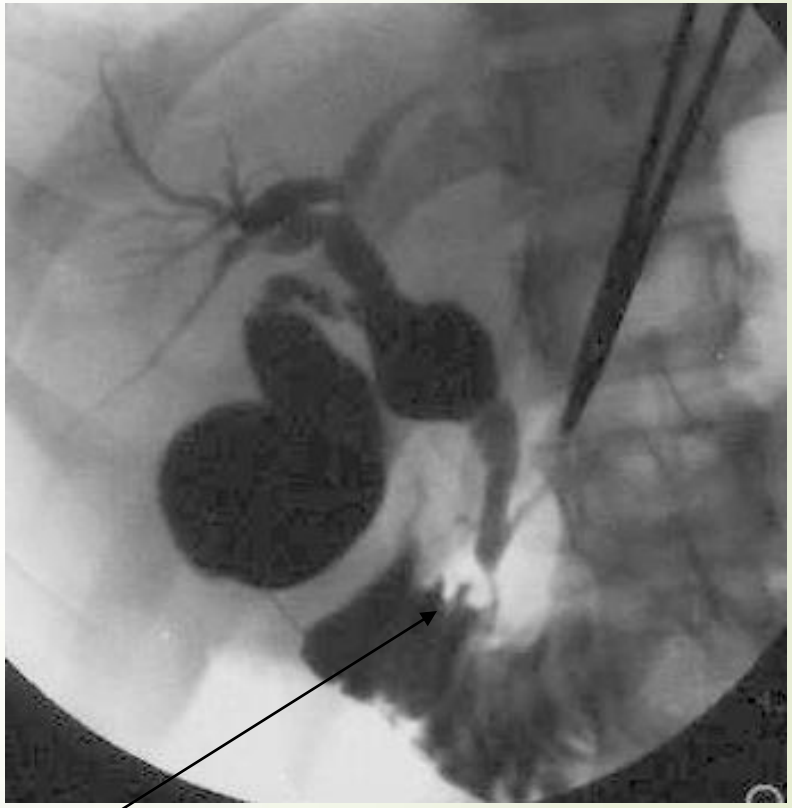
Pre operative risk assessment

- High risk (>50%): ERCP
  - Clinical Jaundice, Cholangitis
  - Bilirubin > 3mgm
  - CBD > 6mm, Stone in CBD
- Moderate risk (10-50%): MRCP/EUS/IC
  - H/O of Jaundice or pancreatitis
  - Multiple small stones in GB
  - Raised Al.Phosphatase and bilirubin
- Low risk (< 5%):
  - Normal Liver profile
  - US: Normal CBD. Large stone in GB
  - No H/O of Jaundice or pancreatitis

Intraoperative Suspicion

- Intraoperative cholangiogram
- Laparoscopic ultrasound
- Indocyanine green injection

Laparoscopic Cholangiogram



STATIC filling defect **DYNAMIC**

Laparoscopic Cholangiogram

Advantages

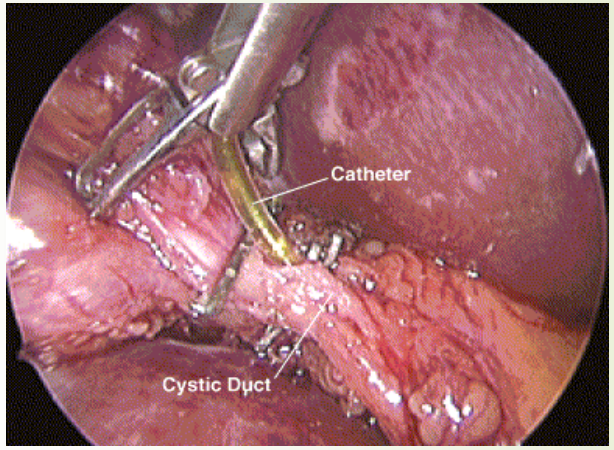
- Identification of biliary anatomy
- Recognition of aberrant anatomy
- Early recognition of CBD injury
- Identification of CBD stones

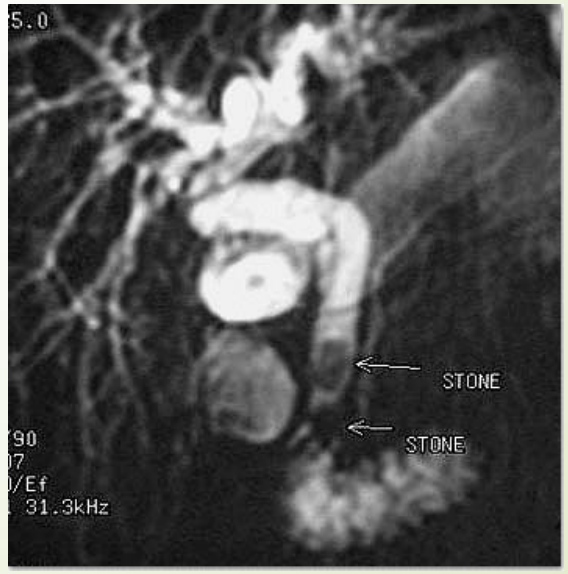
Disadvantages

- Increased OR time
- Increased cost
- Requires advanced technical skills

Cholangiogram
Dynamic

- Less time consuming (<5 mn)
- Better quality and higher resolution
- Higher success rate (99%)
- Possibility of interaction with the findings
- Required for transcystic exploration of CBD
- Limited availability





Cholangiogram
Static

- Time consuming (>16 min)
- Film often inadequate
- Lower success rate (47%)
- Visualization of anatomy more difficult
- Difficulty in differentiation between stones and air bubbles

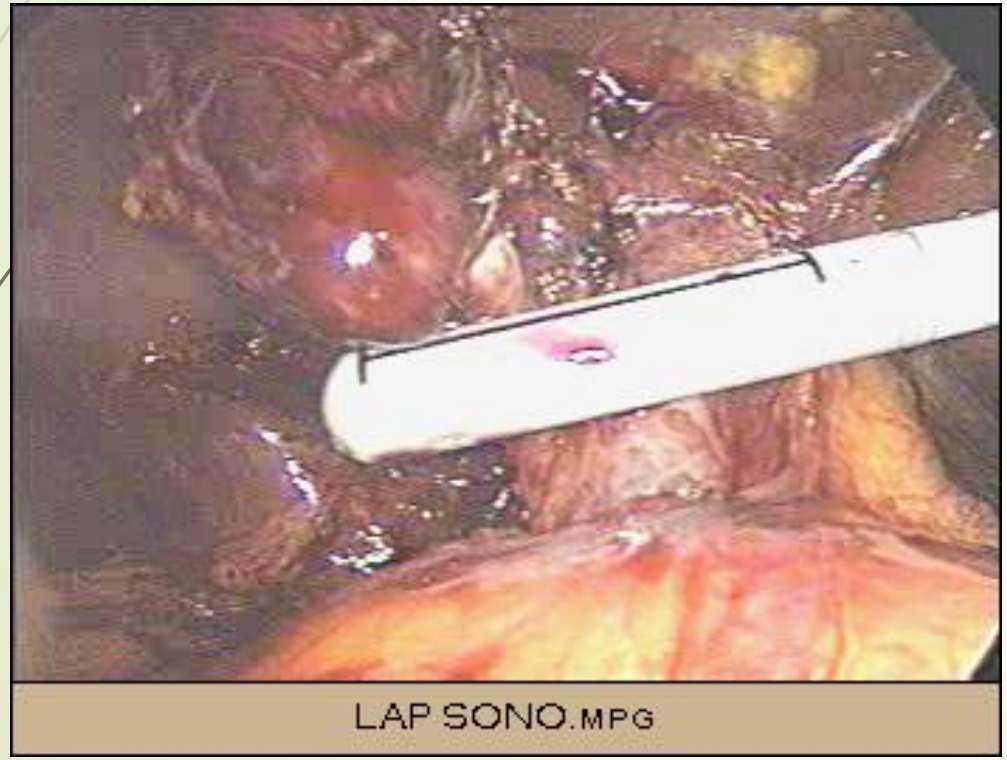
Current trends regarding intra-op cholangiogram

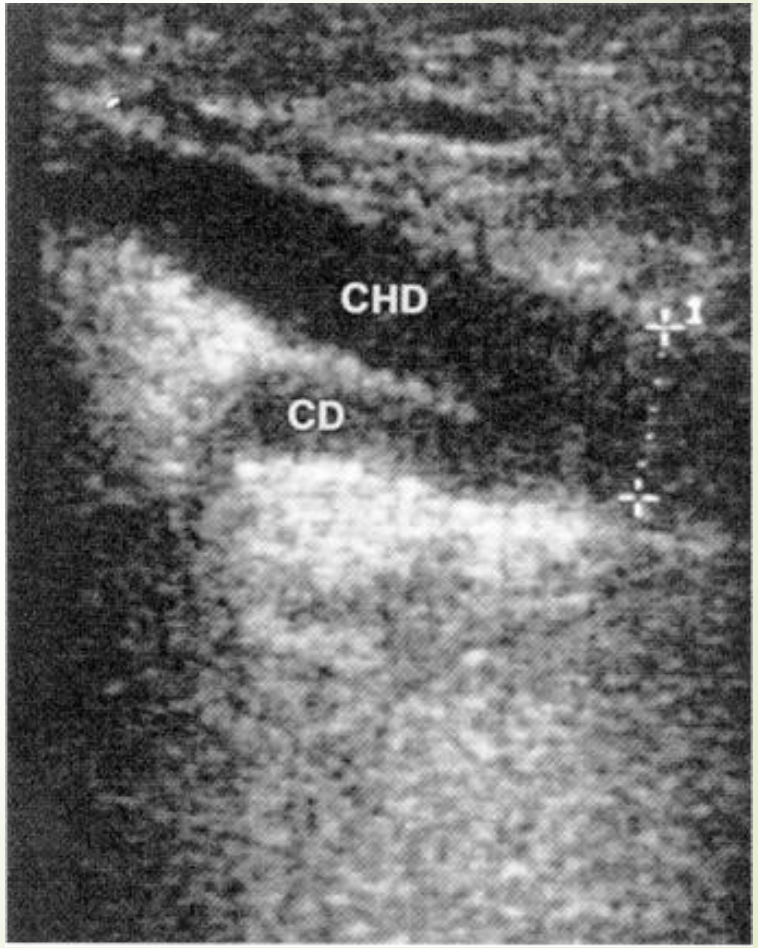
Survey performed among 4,100 general surgeons

- ✓44% responders
- ✓27% defined themselves as routine IOC users
- ✓91% reported IOC use in >75% of Lap chole
- ✓Academic surgeons less prone to use (15% vs 30%)
- ✓Selective users more often low volume surgeons
- ✓Routine users more often high volume surgeons

"Surgeons at greatest risk for causing common bile duct injury (inexperienced, low-volume surgeons) and those who have the greatest opportunity to train others are less likely to use IOC routinely. These represent target groups for quality-improvement intervention aimed at broader IOC use"

Laparoscopic Ultrasound





Laparoscopic Ultrasound

Advantages:

- Not time consuming (mean 8 min) (Santambrogio 1995)
- Safe (Jakimowicz 1993)
- Can be easily repeated at any stage of the operation (Rothlin 1994)
- High success rate (~90%) (Santambrogio 1995)
- High sensitivity (90%)and specificity (96%) (Oberlin 1994)

Disadvantages

- Failure to recognize biliary injuries (Santambrogio 1995)
- Increased cost
- Requires surgeon ability in performing ultrasound (Stiegman 1994)
- Inadequate examination of the distal CBD (Santambrogio 1995)
- Low resolution for anatomical details (Pietrabissa 1995)