Biliary Stones & Biliary Obstruction

Tuesday, Sept 11 2007 , Dr.Faisal Al-Saif

Note : notes written in italic are extras for your own understanding

Physiology :

- **Bile flow 1 L / Day**
- **Gall Bladder (GB) capacity 50 c.c.**

Note : ***Actually , it receives more than 50 c.c. , but the gallbladder absorbs all the water & saturates the contents to 50 c.c.***

- **Components :**
  1) Bile salts **(Cholesterol + Glycine/Taurine)**
  2) Bile Pigments (Bilirubin)
  3) Cholesterol
  4) Phospholipids
- **Increased secretion by :**
  - Vagus
  - CCK **(cholecystokinin)**
- **Decreased secretion by :**
  - VIP
  - Sympathetic
- **Enterohepatic circulation .**

Note : ***Normally 90% of the bile is reabsorbed in the terminal ileum. But patients with a terminal ileal problem (e.g. Crohn's disease) there is no reabsorption , so most of the bile will be lost through the stool. So there will be an increase in cholesterol synthesis & the percentage of cholesterol in the bile will be more than the bile salts & formation of gallstones will be higher.***

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Gall Stones :

- Types of stones

1) Cholesterol stones 75%
2) Pigment stones (brown : bacterial inf. & black : hemolytic anemia) 25%

Risk Factors (cholesterol stones):

- **The 4 F's : Female, Fertile, Fat, Forty**

  Note : ***what's special about a female that is fertile & forty is the existence of Estrogen in her body . Now why is Estrogen a risk factor for gallstone formation ? it's because it relaxes the smooth muscles → inhibits Gallbladder contraction → stasis (no movement) → stone formation .***

- **Family history**
- **Race** (increased in Indian-americans)
- **Factors that increase Cholesterol Ratio :**
  - Ileal disease (e.g. Crohn's Dis.)
  - Diet
  - Rapid weight loss

  Note: ***Patients having gastric bypass → 75% develop gallstones b/c the bile is rich in cholesterol → (↑) stone formation . So that's why they usually do a cholecystectomy along with gastric bypass.***
- **Causes of Dismotility :**
  - Drugs **(Estrogen, OCP (oral contraceptive pills) , Octreotide)**
  - TPN **(total parentral nutrition)**
  - Spinal cord injury
  - Vagotomy (in peptic ulcer disease they remove the vagus which supplies it → (↓) GB contraction → stone formation.
  - DM (?) → it's related to prolonged ANS → postural hypotension → (↓) vessel contraction → (↓) GB contraction → stasis → stone formation.
- **Black pigment stones**
  - Hemolytic anemia
  - Cirrhosis
- **Brown pigment stones**
  - Bacterial infection

Asymptomatic Gallstones :

* 10-20% of population.
* 1-2% will develop symptoms annually
* If Gallstones are asymptomatic we do NOT remove the stones except if :
  1) Large stone >2 cm **(b/c small stones pass through the stool)**
  2) DM : **(↓) immunity → may develop infection → acute cholecystitis → may develop gangrenous GB .**
  3) Hemolytic anemia
  4) During surgery

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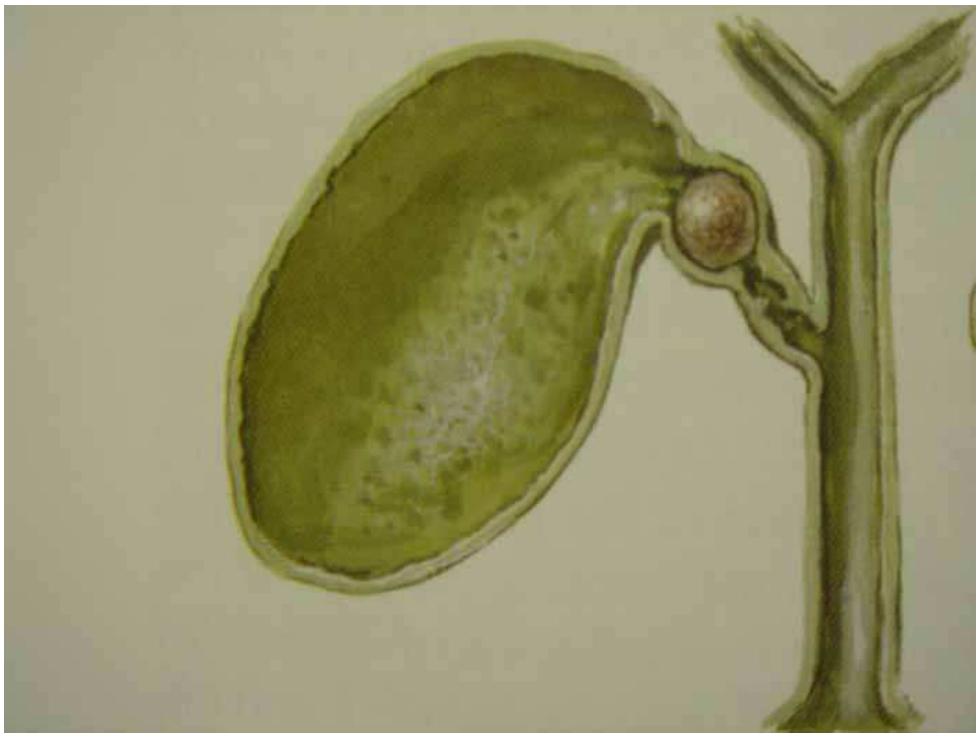
Symptomatic Cholelithiasis :

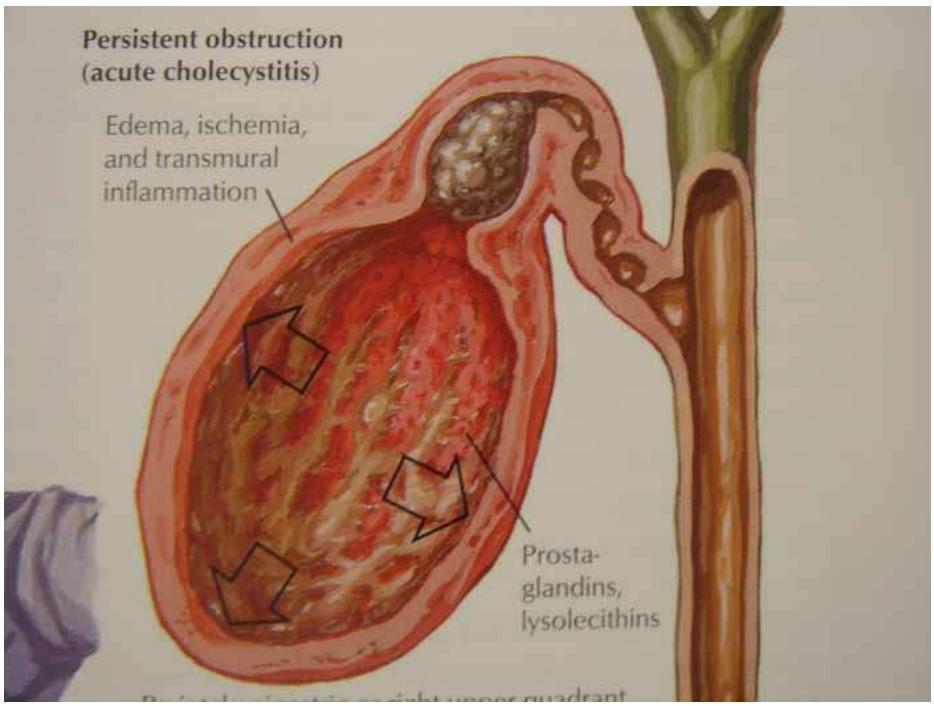
- Recurrent attacks of RUQ (right upper quadrant) pain
- Colicky (pain that comes & goes)
- Nausea +/- vomiting
- Related to food
- Short duration
- No fever, tenderness or ↑ WBC



(why is it colicky in pain ? colicky pain occurs when there is obstruction : when a person eats , the GB pushes the stone to the neck to go out , when it reaches the neck it will be stuck & stops. And after a few minutes in tries to push it again . that's why the pain is colicky in nature " comes & goes")

Acute Cholecystitis

- Sever RUQ (right upper quadrant) pain
- Constant
- Fever
- Murphy's sign : *it is performed by asking the patient to breathe out and then gently placing the hand below the costal margin on the right side (on the approximate location of the gallbladder). The patient is then instructed to inspire (breathe in). If the patient stops breathing in (as the gallbladder is tender and, in moving downward, comes in contact with the examiner's fingers) the test is considered positive.*
- ↑ WBC
- Minor elevation of **LFT**
- US
- HIDA scan



The stone obstructs the venous return to the GB wall → edema → high BP → stops arterial supply → necrosis of GB wall.How many stones can cause a problem ? one stone or a million , it's all the same .. that's why we should always remove the GB instead of the stones , cuase they will always come back.

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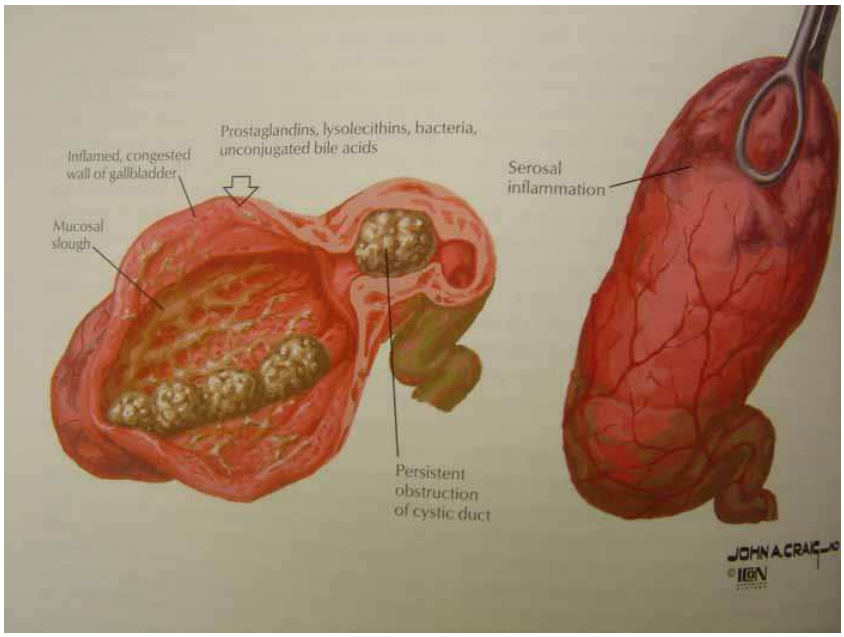
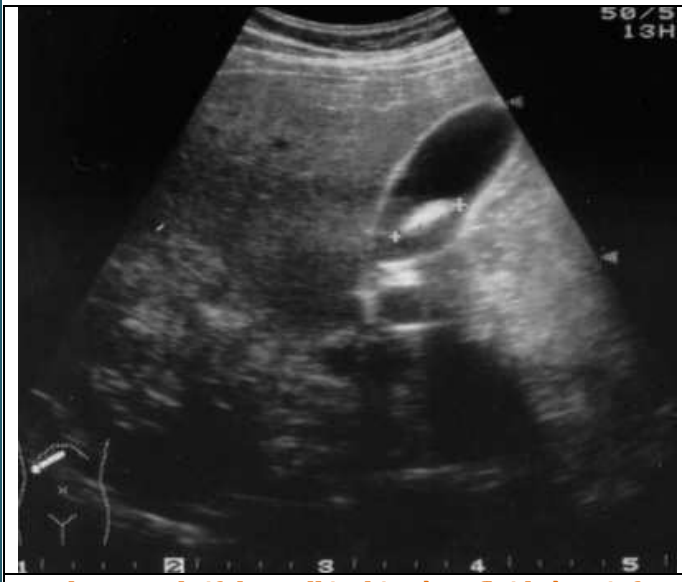
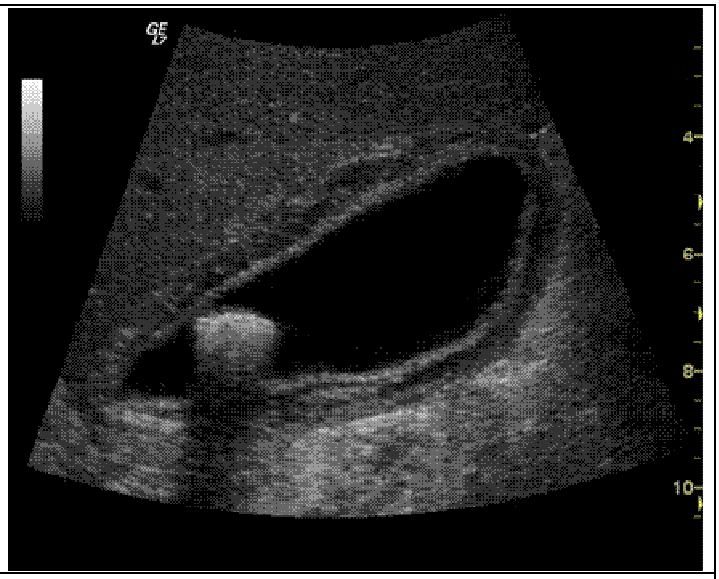
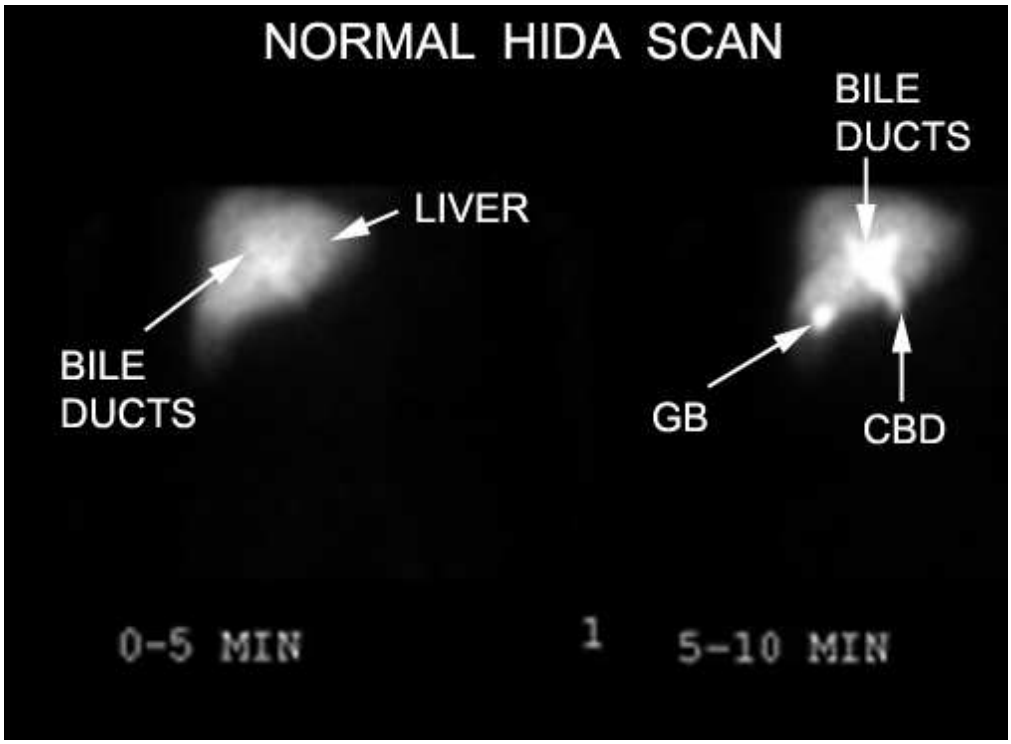




In Ultrasound : if the wall is thin → no fluid → no inf.



if the wall is thick → fluid filled → edema & inflammation.



Right : in acute chol. → no GB shows b/c of obstruction → no fluid goes there

◈ Treatment :

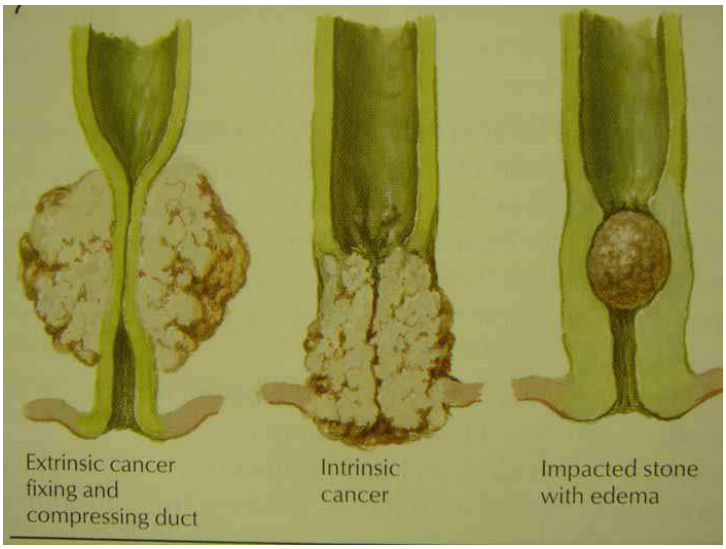
- ✳ NPO
- ✳ IVF
- ✳ Analgesia
- ✳ Abx **(antibiotics)**
- ✳ Surgery **(in acute chol. we wait until the edema is gone then perform the surgery)**

◈ Complications of Acute Cholecystitis:

- ✳ Empyema
- ✳ Perforation
- ✳ Cholecysto-enteric fistula
- ✳ Gall-stone ileus **(50% die)**
- ✳ Mirizzi syndrome

Biliary Obstructions :

- ✳ Intraluminal
- ✳ Luminal
- ✳ Extraluminal

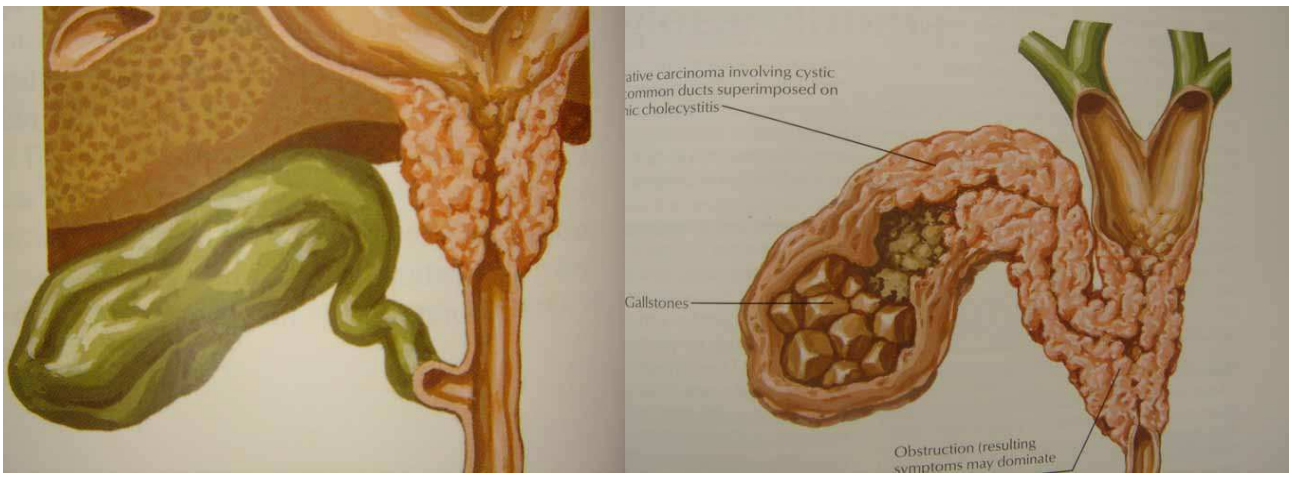


◈ Choledocholithiasis

- Primary CBD stones
- Secondary CBD stones

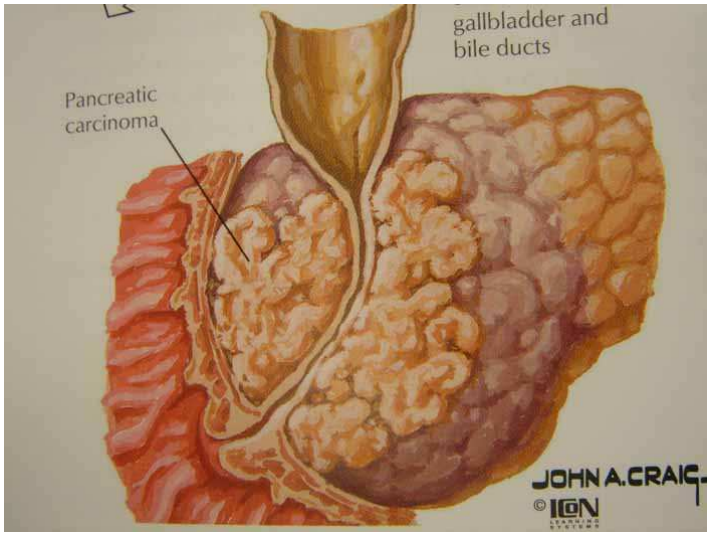
◈ CBD stricture

- Benign
- Malignant



◈ Extraluminal pathology

- Pancreas
- LNs
- Liver

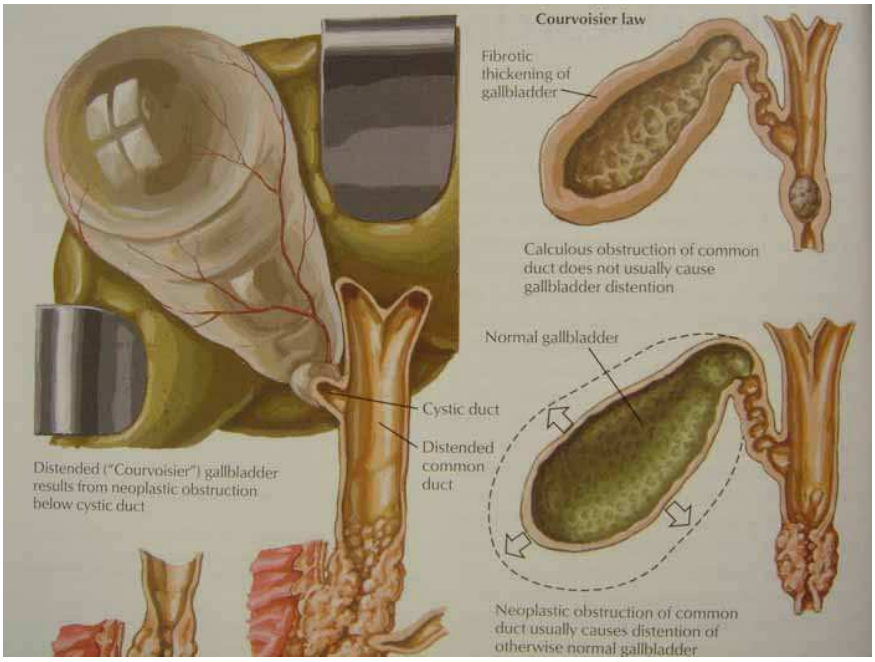


◈ Presentation

- Jaundice
- Pain
- Wight loss
- Fever

◈ Examination

- Fever
- Septic shock
- Jaundice
- Cachexia
- Enlarged gall bladder



Investigations :

- CBC **(complete blood count)**
- LFT **(liver function test)**
- PTT, INR (**Partial Thromboplastin Time)**
- US
- CT
- ERCP **(Endoscopic Retrograde Cholangiopancreatography)**
- PTC

Surgery Group 425