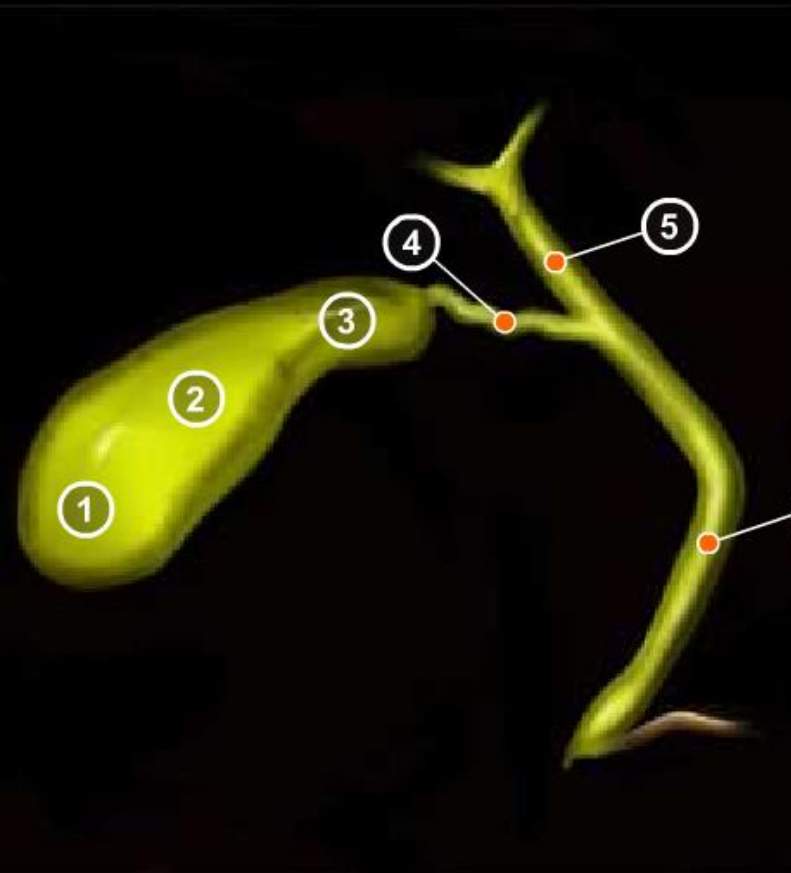



# **ACUTE CHOLECYSTITIS**

Koray Topgül, MD, Prof.  
Department of General Surgery

Acute cholecystitis  
is  
inflammation of gall-bladder.

# BILIARY ANATOMY



Topographical anatomy 

Biliary anatomy  Vascular supply

① Fundus

② Body

③ Infundibulum

④ Cystic duct

⑤ Common hepatic duct

⑥ Common bile duct

# BILE STONES



# BILE STONES



# Gallstone Pathogenesis

- Bile contains:
  - Cholesterol
  - Bile salts
  - Phospholipids
  - Bilirubin
- Gallstones are formed when cholesterol or bilirubinate are supersaturated in bile and phospholipids are decreased

# Gallstone Pathogenesis

## ➤ Stone formation is:

1. Initiated by cholesterol or bilirubinate super saturation in bile
2. Continued to crystal nucleation (microlithiasis or sludge formation)
3. And gradually stone growth occur

## ➤ Gallstone types

1. Cholesterol
2. Pigment
  - Brown
  - Black

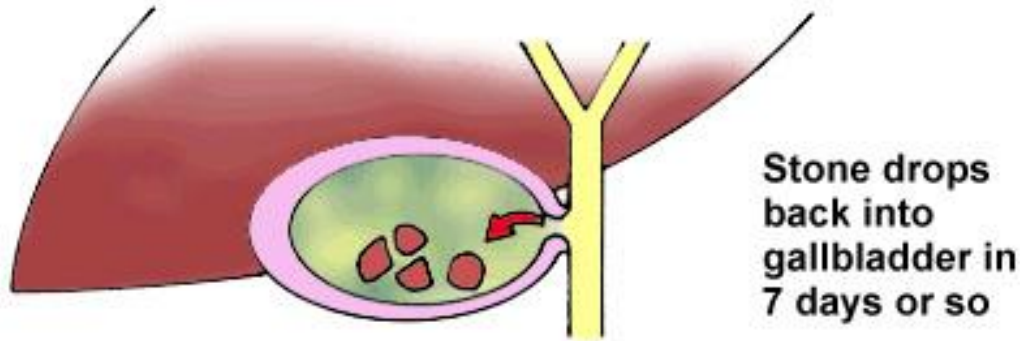
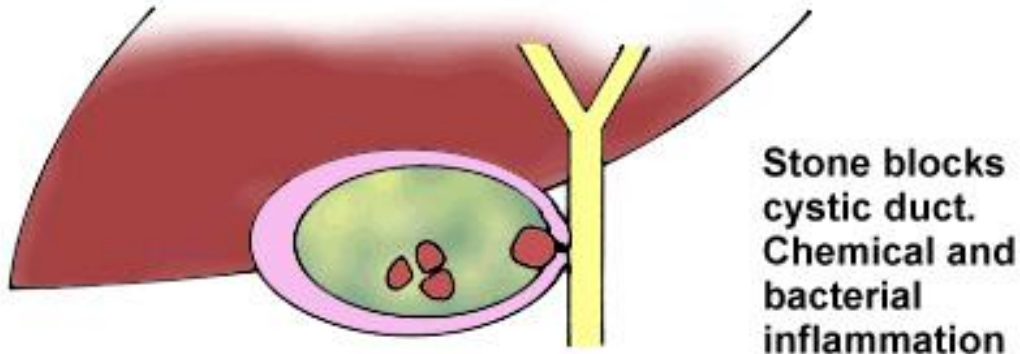
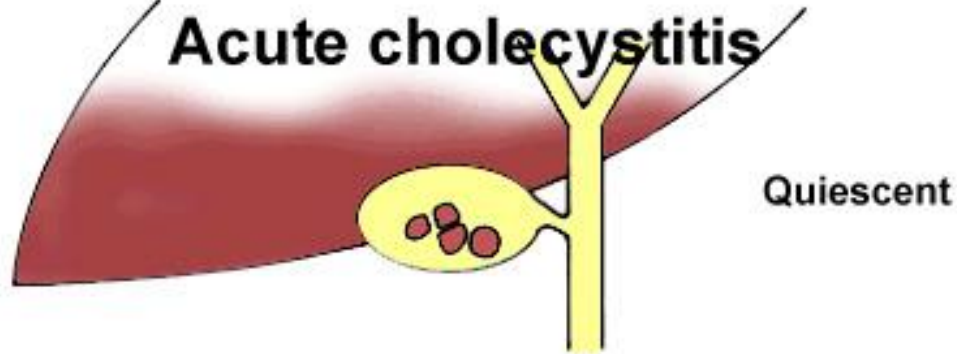
# Definitions

## ➤ Acute cholecystitis

- Acute GB distension, wall inflammation & edema due to cystic duct obstruction.
- RUQ pain (>24hrs) +/- fever, ↑WBC, Normal LFT,
  - Murphy's sign = inspiratory arrest



# Acute cholecystitis



The pathological sequences during a bout of uncomplicated cholecystitis

# Definitions

## ➤ Chronic cholecystitis

- Recurrent bouts of biliary colic leading to chronic GB wall inflammation/fibrosis.
- No fever, No leukocytosis, Normal LFT

# Definitions

## ➤ Biliary colic

- Wax/waning postprandial epigastric/RUQ pain due to transient cystic duct obstruction by stone
- No fever, No leukocytosis, Normal LFT

# Asymptomatic Gallstone

- Incidentally found gallstone in ultrasound exam for other problems
  - Many individuals are concerned about the problem
- Sometimes pt. has vague upper abdominal discomfort and dyspepsia which cannot be explained by a specific disease
  - If other work up are negative may be
- **Routine cholecystectomy is not indicated**

# Risk Factors for Gallstones

- Obesity
- Rapid weight loss
- Childbearing
- Multiparity
- Female sex
- First-degree relatives
- Drugs: ceftriaxone, postmenopausal estrogens,
- Total parenteral nutrition
- Ethnicity: Native American (Pima Indian),  
Scandinavian
- Ileal disease, resection or bypass
- Increasing age

# Clinical signs

## *Pain*

Characteristic for it is great acute pain in **right hypochondrium** and **epigastric area** with an irradiation in right supraclavicular area and right shoulder. If pain syndrome has the strongly expressed character, it is named billiary colic.

***Dyspepsic syndrome.*** Frequent symptoms which disturb a patient, are nausea, frequent vomitting, at first by gastric maintenance, and later — **with bile**. Afterwards feelings of swelling of stomach, delay of emptying and gases.

# Symptoms and clinical signs

**Murphy's sign** is a delay of breathing during palpation of gall-bladder on inhalation.

**Kehr's symptom** is strengthening of pain at pressure on the area of gall-bladder, especially on deep inhalation.

**Ortner's symptom** — painfulness at the easy pushing on right costal arc by the edge of palm.

# Complications

***Hydropsy (mucocele)*** of gall-bladder is its aseptic inflammation, that arises up as a result of blockade of cystic duct by concrement or mucus. The bile from a bubble is sucked in, and on replacement transparent exudation accumulates in its formation. During palpation increased and unpainfully gall-bladder is marked in patients.



# Complications

## ***Biliary pancreatitis***

**Worsening of the patient's condition, appearance of pain,**

**frequent vomiting,**

**signs of cardio-vascular insufficiency,**

**high amylasuria,**

**presence of infiltrate in epigastric area**

**An icterus arises up at violation of passage of bile in duodenum as a result of obturation of choledochus by concrement, by putty or through the edema of head of pancreas.**

**Thus icterus sclera, bilirubinemia, dark urine and light unpainted excrement arise.**

## ➤ Cholangitis

- The **Charcot triad** is characteristic for the patient with this pathology. Next to **pain** syndrome and **icterus**, the temperature of body rises to 38–39 °C, there is a **fever**, high leucocytosis and decline of sizes of functional tests of liver is observed.

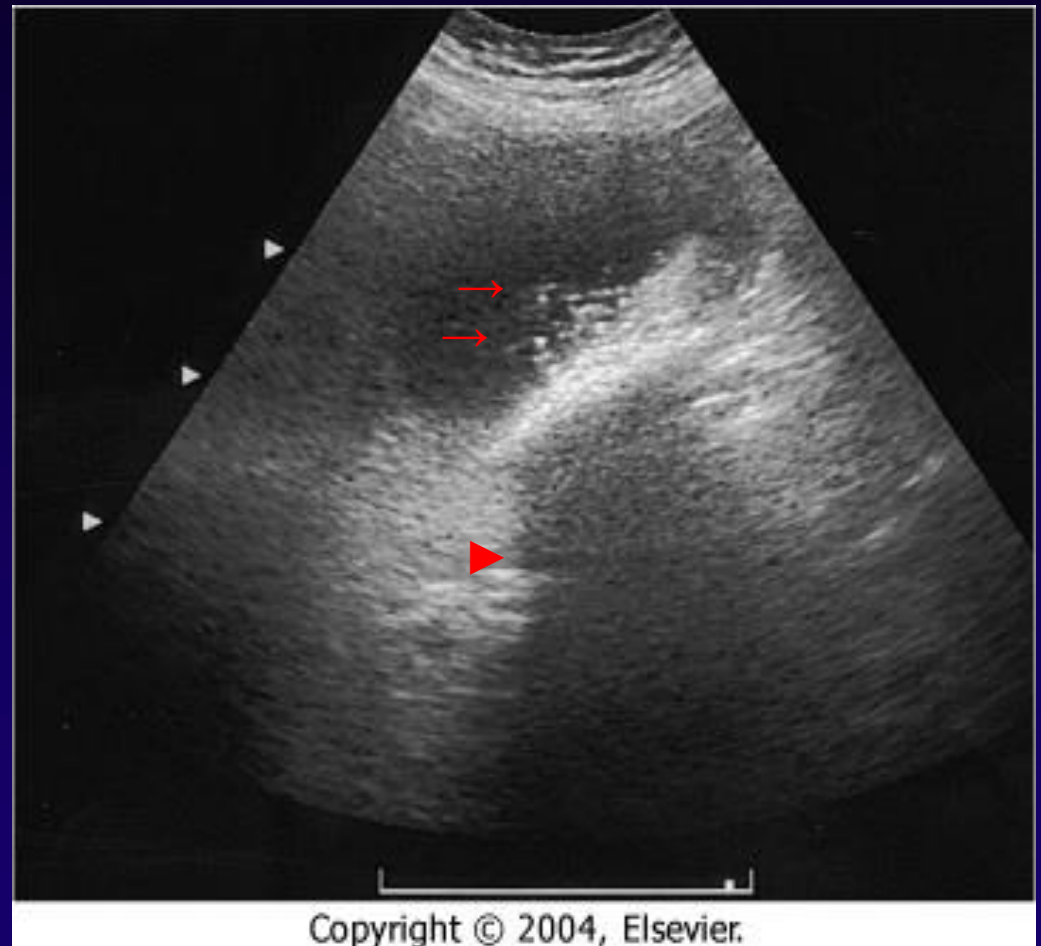
- **Empyema** of gall-bladder is unliquided in time hydropsy, that at repeated infection is transformed in a new form.
- The **high temperature** of body is periodically observed. In blood **high leucocytosis** with the shift of formula of blood to the left is present.

# DIAGNOSIS

1. Anamnesis and physical methods of inspection.
2. Survey sciagraphy of organs of abdominal cavity.
3. Sonography.
4. General analysis of blood and urine.
5. Diastase urines.
6. Biochemical blood test (bilirubin, amylase, alanine aminotransferase, asparaginase, alkaline phosphatase, creatinine).
7. Coagulogram.

# Gall bladder ultrasound

- Shows gallstones
- the acoustic shadow due to absence of reflected sound waves behind the gallstone



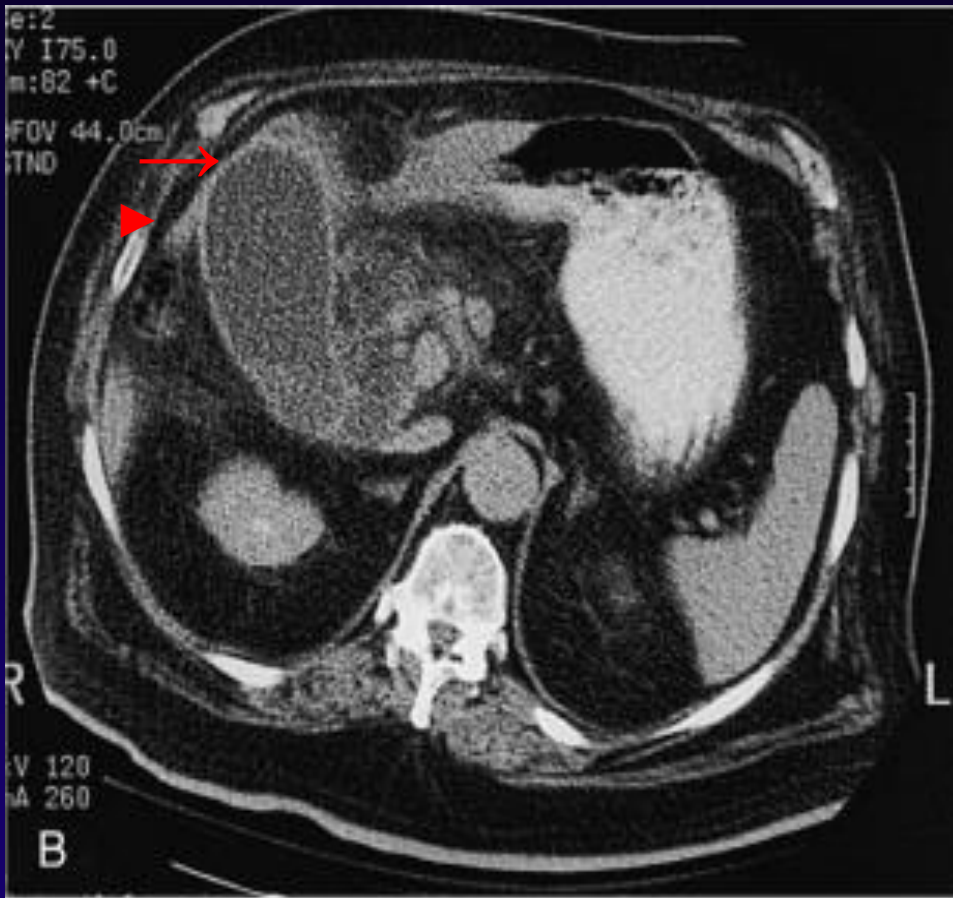
# Ultrasound



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- Curved arrow
  - Two small stones at GB neck
- Straight arrow
  - Thickened GB wall
- ◀
  - Pericholecystic fluid = dark lining outside the wall

# CT scan



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- → denotes the GB wall thickening
- ► denotes the fluid around the GB
- GB also appears distended

# Complications of acute cholecystitis

## ➤ Hydrops

- Obstruction of cystic duct followed by absorption of pigments and secretion of mucus to the gallbladder (white bile)
- There may be a round tender mass in RUQ

## ➤ Urgent Cholecystectomy is indicated



# Complications of acute cholecystitis

- Empyema of gallbladder
  - Pus-filled GB due to bacterial proliferation in obstructed GB. Usually more toxic with high fever
- Emergent operation is needed

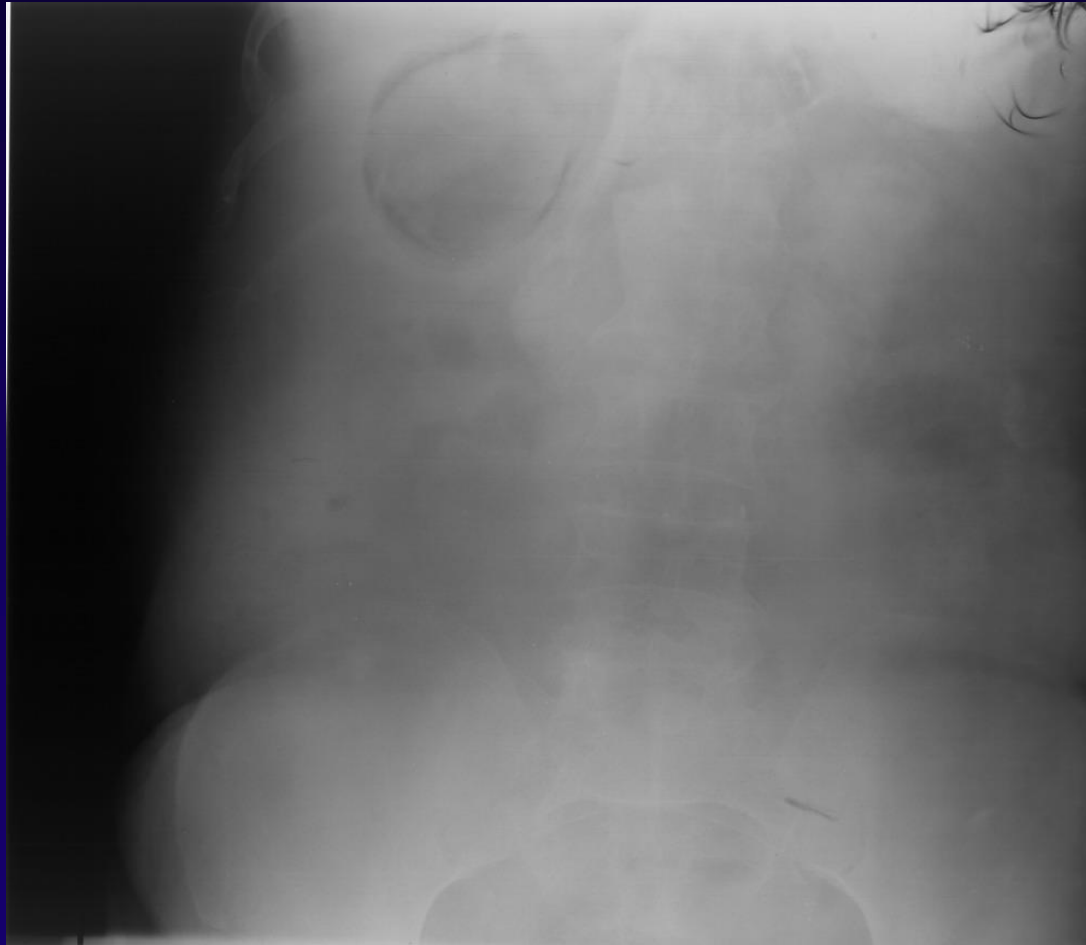
# Complications of acute cholecystitis

## ➤ Emphysematous cholecystitis

- More commonly in men and diabetics.  
Severe RUQ pain, generalized sepsis.
- Imaging shows air in GB wall or lumen

## ➤ Emergent cholecystectomy is needed

# Emphysematous cholecystitis



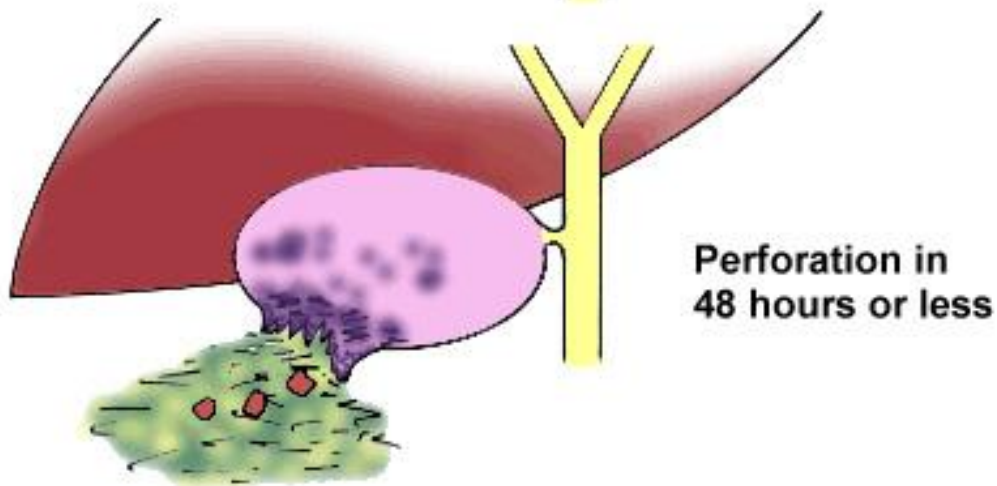
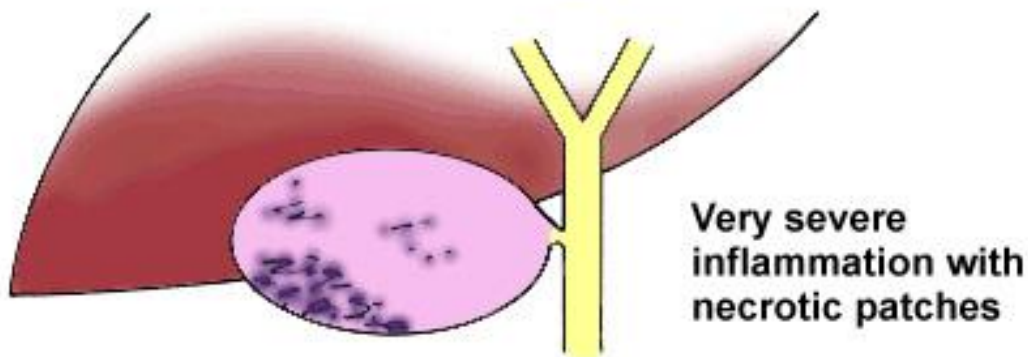
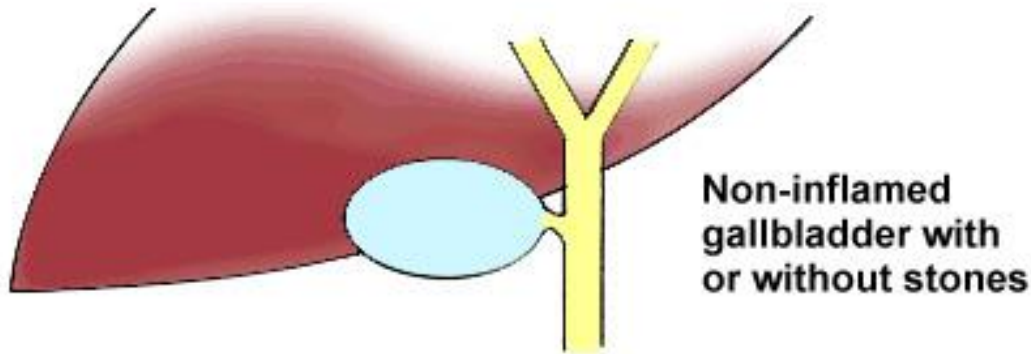
# Complications of acute cholecystitis

## ➤ Perforated gallbladder

- Pericholecystic abscess (up to 10% of acute cholecystitis)
  - Percutaneous drainage in acute phase
- Biliary peritonitis due to free perforation

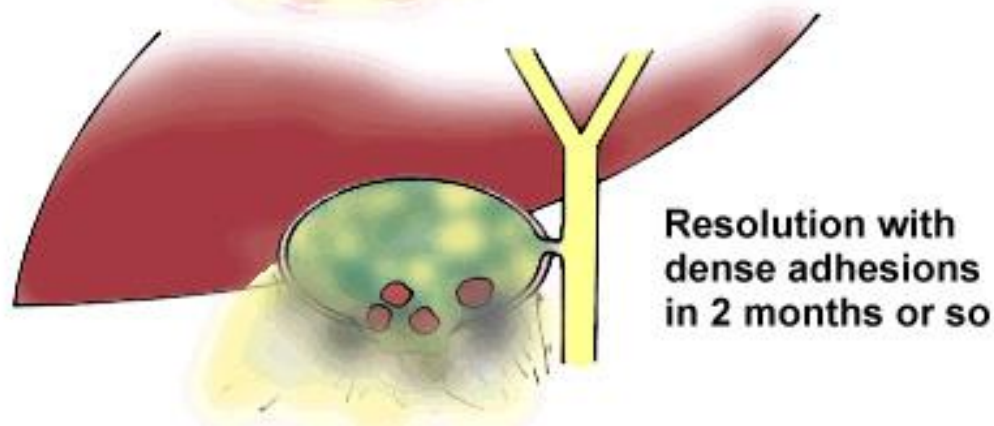
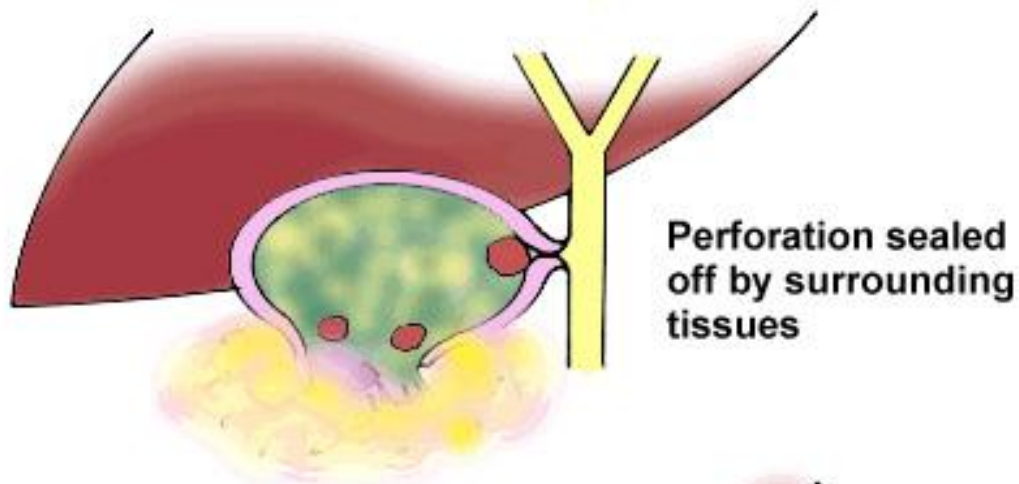
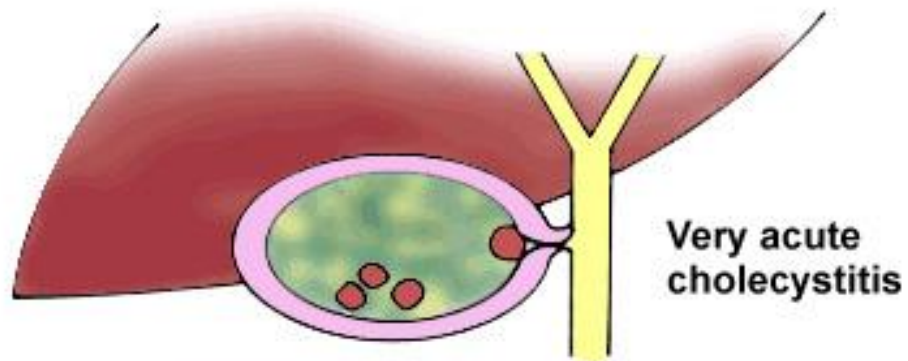
## ➤ Emergent Laparotomy

# Perforation



Sequence of  
pathological  
processes leading  
to perforation of  
the gallbladder

# Localized perforation



Sequence of pathological processes localising a perforation of the gallbladder

# Gallstone Ileus



# Definitions

## ➤ Acalculous cholecystitis

- A form of acute cholecystitis
- GB inflammation due to biliary stasis(5% of time) and not stones(95%).
- Often seen in critically ill patients
- Emergent operation is needed



## ➤ Cholangitis

- Infection within bile ducts due to obstruction of CBD.
- Infection of the bile ducts due to CBD obstruction secondary to stones, strictures
- May lead to life-threatening sepsis and septic shock
- It may present as two forms:
  - Suppurative
  - Non-suppurative

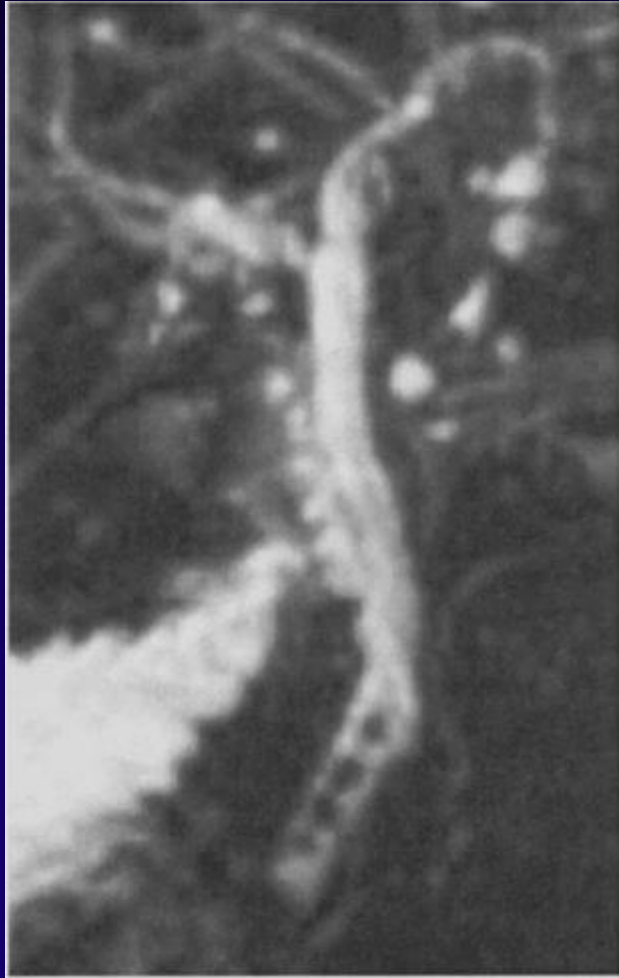
➤ Non suppurative:

- Persistent RUQ pain + fever + jaundice, (Charcot's triad) ↑WBC, ↑LFT,

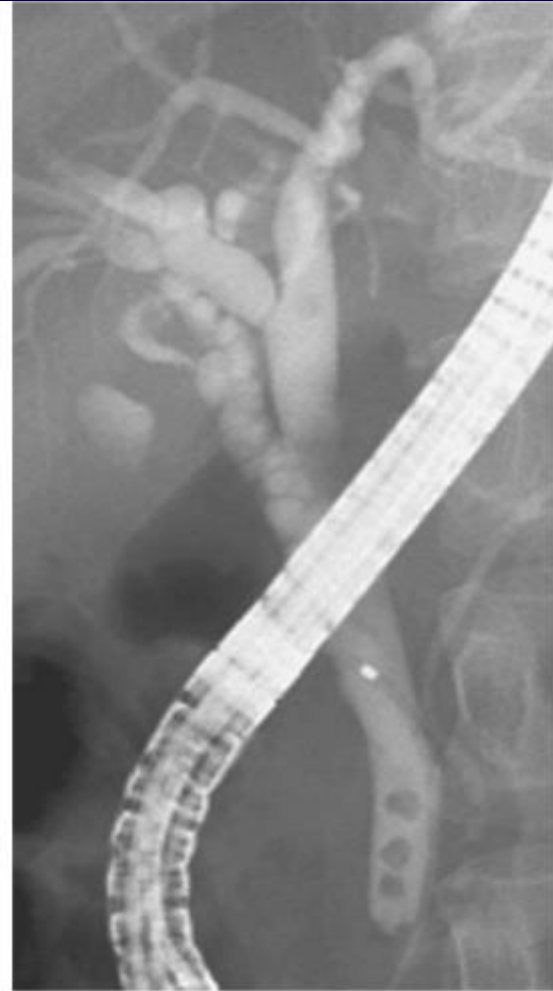
➤ Suppurative:

- Persistent RUQ pain + fever + jaundice, ↑WBC, ↑LFT,
- Hepatic encephalopathy or hypotension may ensue (Reynold's pentad)

# MRCP & ERCP



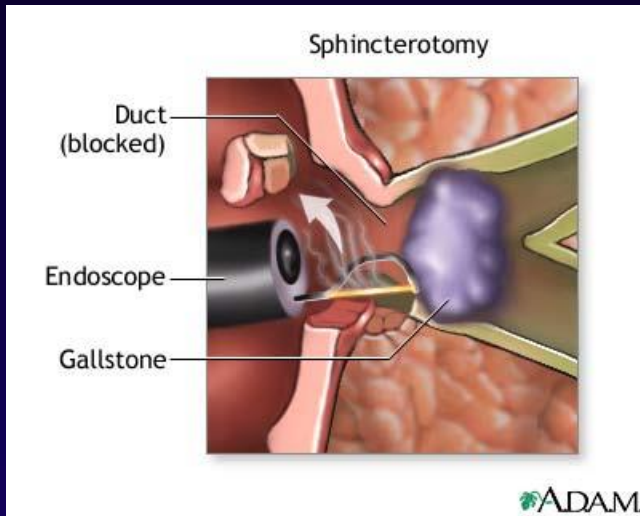
A



B

# ERCP

## endoscopic sphincterotomy



# Retrieving the CBD Stones

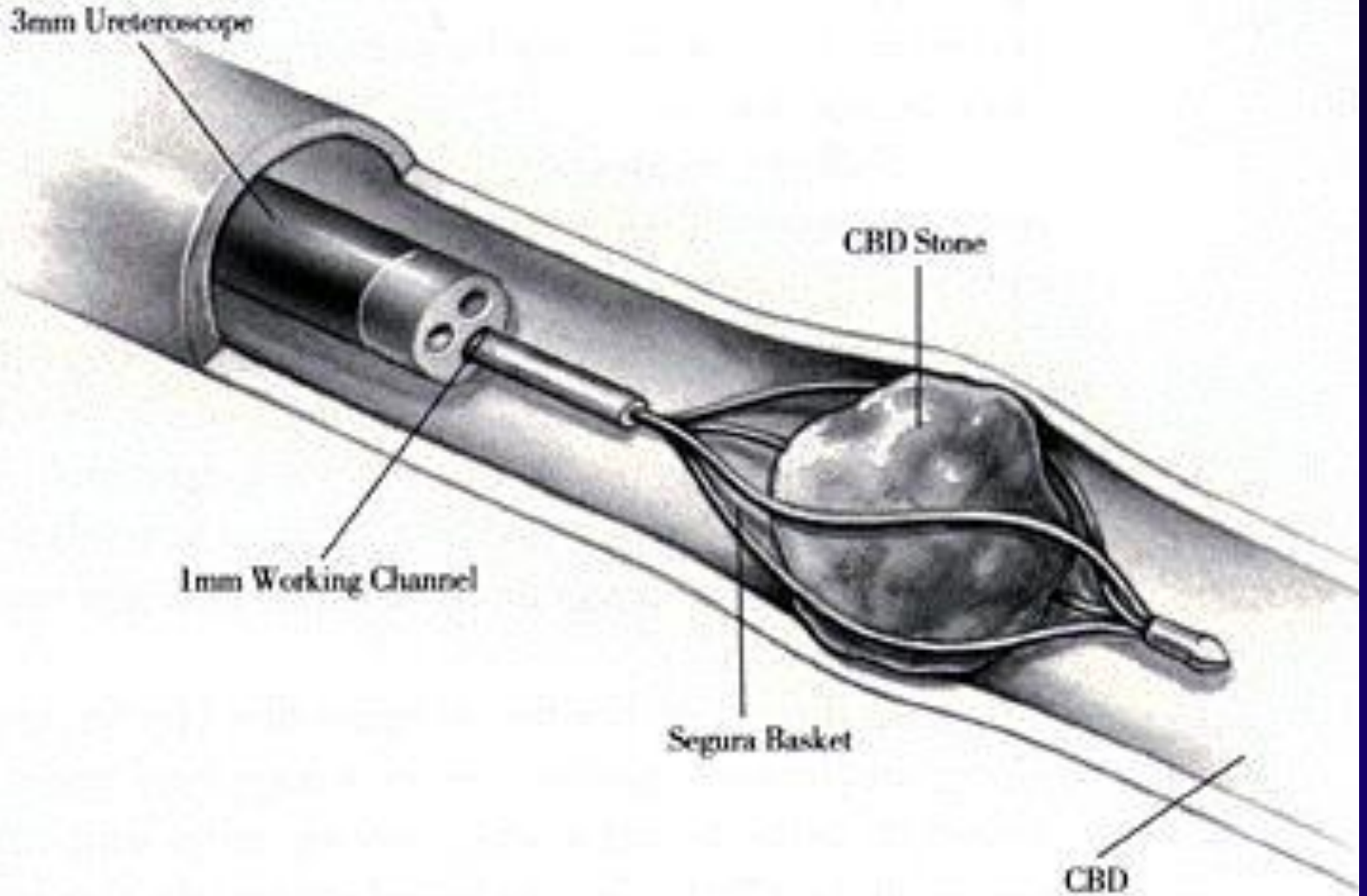
3mm Ureteroscope

1mm Working Channel

CBD Stone

Segura Basket

CBD



# Gallstone pancreatitis

- 35% of acute pancreatitis secondary to stones
- Pathophysiology
  - Reflux of bile into pancreatic duct and/or obstruction of ampulla by stone
- ALT > 150 (3-fold elevation) has 95% PPV for diagnosing gallstone pancreatitis
- Tx: ABC, resuscitate, NPO/IVF, pain meds
- Once pancreatitis resolving, ERCP & stone extraction/sphincterotomy
- Cholecystectomy before hospital discharge in mild case

# Porcelain Gallbladder

- A **precancerous** condition
- Needs cholecystectomy



# Treatment



# Medical Treatment

- Medical treatment for
  - Acute biliary colic attack
  - Acute cholecystitis with comorbid diseases

Including:

- GI rest
- NG tube if vomiting
- IV Fluids
- Analgesics (*not morphine*)
- Antibiotics for *cholecystitis* (against GNR & enterococcus)

# Surgical Treatment

- Early cholecystectomy for *acute cholecystitis* (usually within 48-72 hrs—GOLDEN PERIOD)
  - Laparoscopic
  - Open
- Elective **cholecystectomy** for *biliary colic, chronic cholecystitis* and *some asymptomatic stones*
  - Laparoscopic
  - Open
- **Cholecystostomy** is the best choice if patient is *too sick or anatomy is deranged*
  - Percutaneous
  - Open