

Clinical Cases - Cholecystectomy

08/11/2017

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When should we remove the gallbladder?

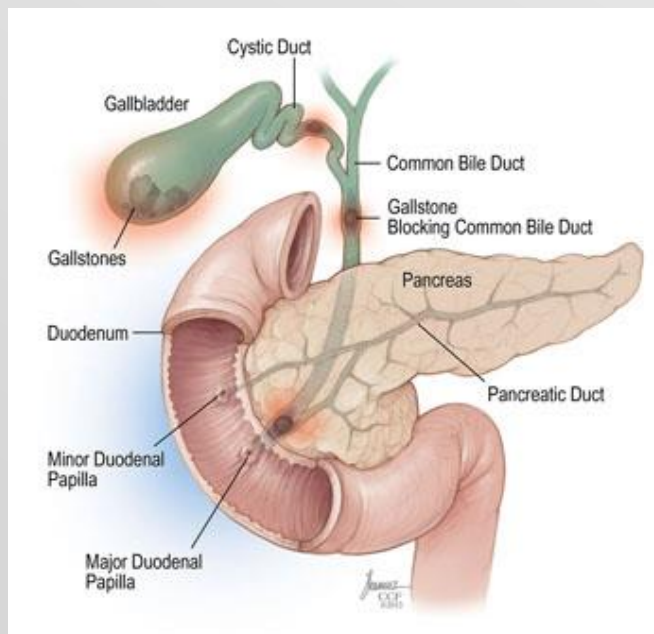
- symptomatic gallstones → biliary cholic
- acute cholecystitis
- chronic disease → calcified (porcelain) gallbladder
- gallbladder polyp
- gallbladder cancer
- gallbladder trauma

Definition I

Cholelithiasis = gallstone disease without localisation

↙
Cholecystolithiasis
= gallstones in gallbladder

↘
Choledocholithiasis
= gallstones in biliary tract



Cholelithiasis

- Caused by imbalance in the chemical composition of bile
- Female : male = 3 : 1
- 32% of women over 40 years have gallstones
- Increased progression
- 75% of cases without symptoms, 25% symptomatic

Cholelithiasis

- Sludge → tiny crystals → solid stones
- Risk factors = **5 F's** = female, fat, forty, family, fair
- Other risk factors = high-dose oestrogen therapy, combined pill, hypercholesterolemia, rapid weight loss, low activity level
- Types = cholesterol stones (80%), bilirubin stones, mixed stones



http://www.curezone.org/upload/Liver_Flush/Telman/Blog/img006_small.jpg

Definition II

Cholecystitis

= inflammation of the gallbladder

- 90% caused by gallstones + bacterial infection
- 10 % acute necroinflammatory disease

Cholangitis

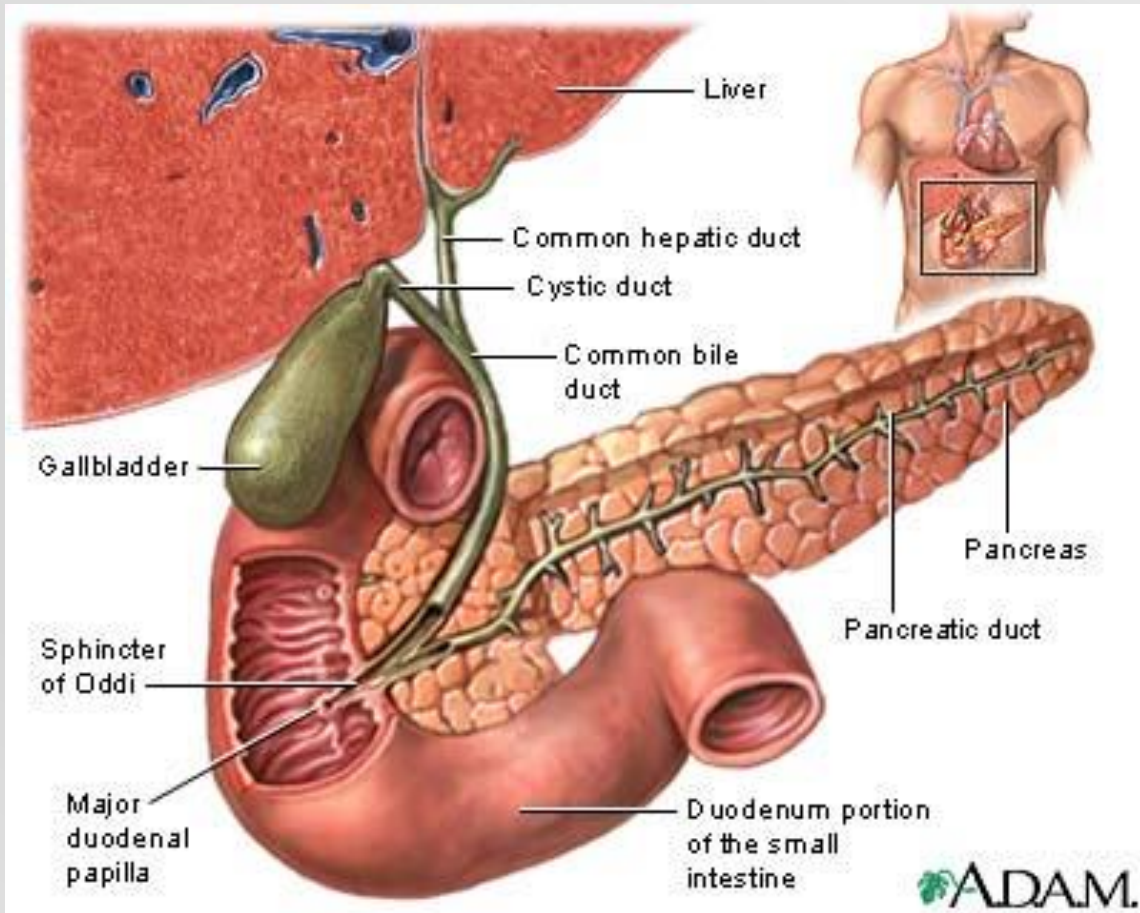
= inflammation of the bile ducts

- Biliary tract obstruction (gallstone, stricture, cancer)
- Ascending bacterial infection

Function of the gallbladder

- Reservoir function for bile (constantly produced by liver)
- Expulsion on demand to facilitate digestion (micelle formation)
- Excretion of bilirubin
- Excretion of cholesterol
- Bactericide action
- Neutralisation of gastric acid

Anatomy of the gallbladder



- Located in the RUQ, sub-costally and sub-hepatically
- Cystic duct connects with Common hepatic duct to form the Common bile duct
- Pancreatic duct drains in Common bile duct and enters the duodenum at the major papilla

Case history

- 45 y/o female patient reports to the emergency physician with severe, RUQ pain
- What next ???

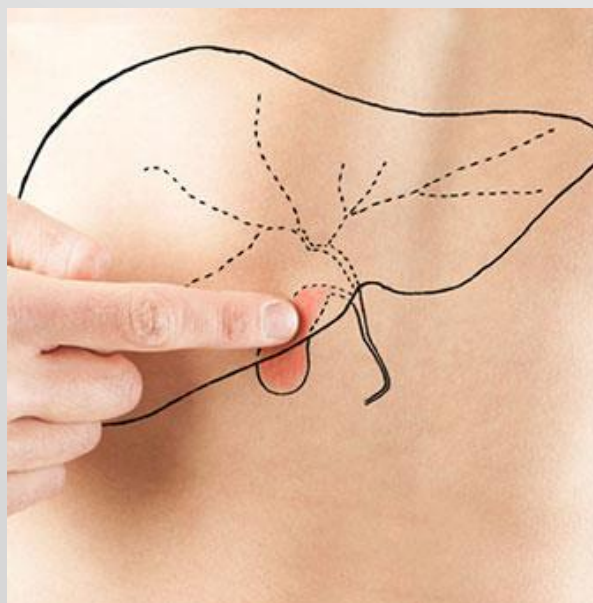


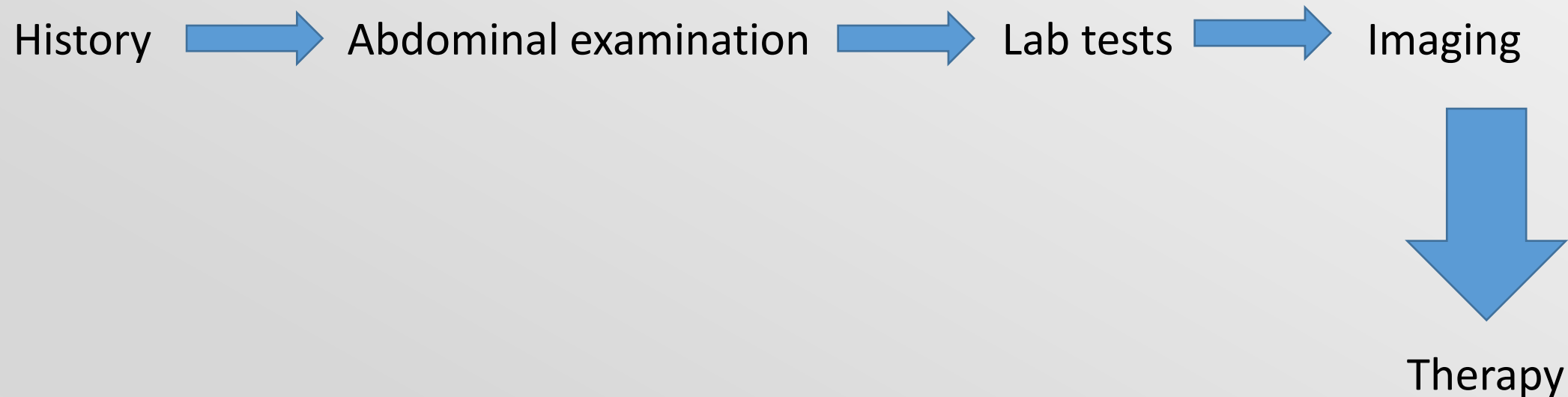
Image from MedicineNet.com



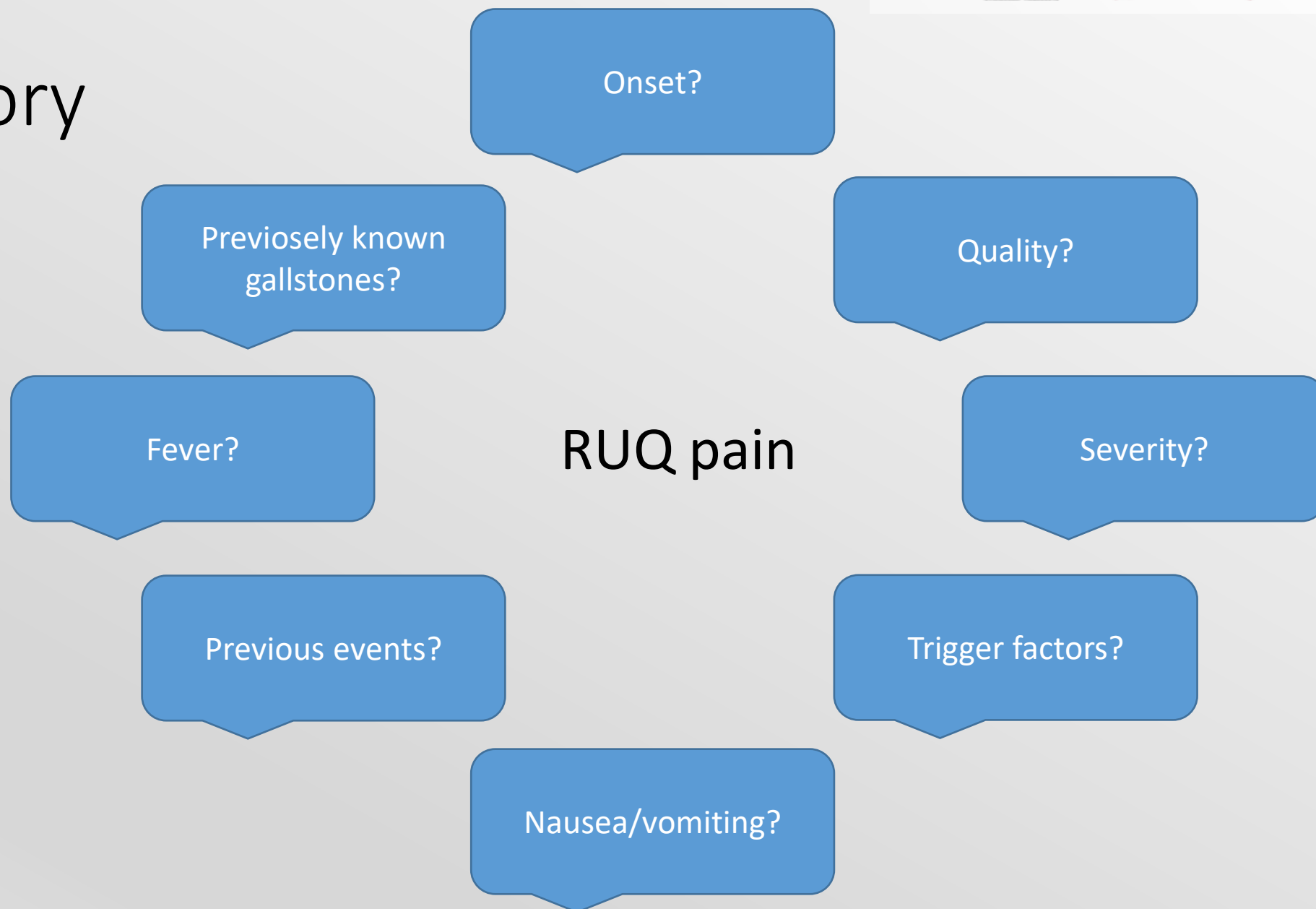
Image from MakeHealthEasy

Case history

- Logical steps:



Case history



Case history

- Summary of symptoms:
 - Since 8 hours, undulating, crampy pain
 - After heavy meal (Käsespätzle)
 - Nauseous + vomited twice
 - Previously numerous similar events, but less severe and max 2 hours duration
 - Body temperature: 38°C
 - No diagnosed gallstones so far

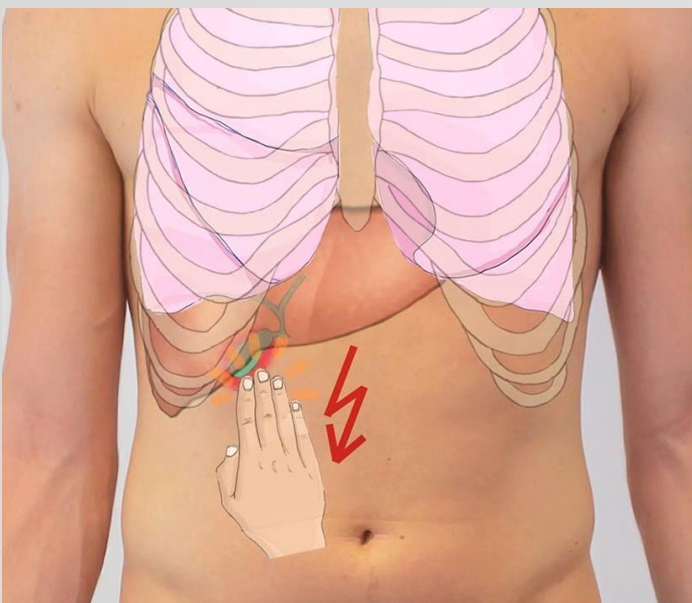
Case history

- Abdominal examination:
 - Inspection: obesity?, stretch marks (= sign for previous pregnancies), icterus
 - Auscultation: normal bowel sounds
 - Percussion: increased tympany
 - Palpation: soft non-tender in 3 quadrants
RUQ very tender and with guarding
 - Special signs: Murphy's sign positive,
Courvosier sign negative

Murphy's sign

= arrest of inspiration during deep pressure under right costal margin

- NOT PAIN under right costal margin !!!



<https://i.ytimg.com/vi/XAOjbh4xE7o/maxresdefault.jpg>

Courvoisier sign

= palpable gall bladder due to biliary obstruction and subsequent enlargement



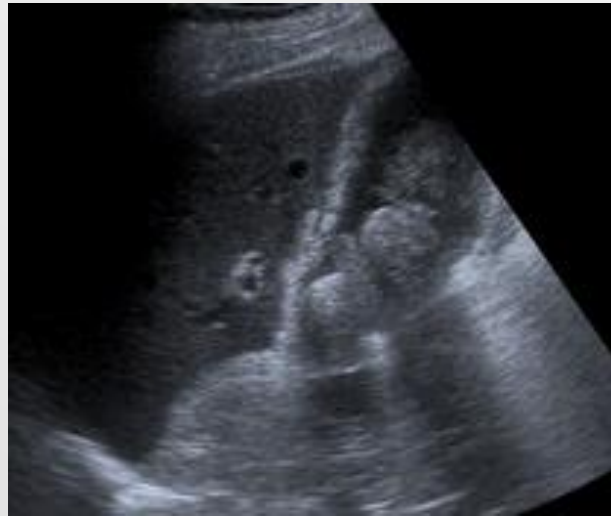
Gallenblasenhydrops von Dock Check

Case history

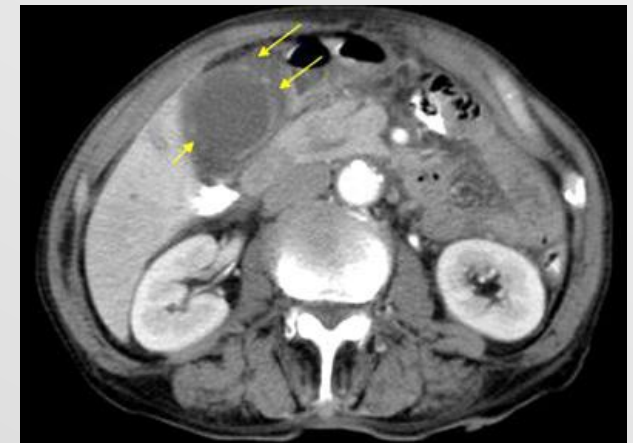
- Lab tests:
 - Inflammation: WBC, CRP
 - Liver status: AST, ALT
 - Biliary obstruction: GGT, AP, Bilirubine
 - Pancreatic involvement: Lipase, Amylase
 - Surgery related parameters: RBC, INR, PTT
 - Blood culture for febrile patients

Case history

- Diagnostic tests:
 - Gold standard = **Ultrasound**
 - Additionally = **CT**
 - Calcified stones = **X-ray**
 - Exclusion of differential diagnosis = **Gastroscopy**



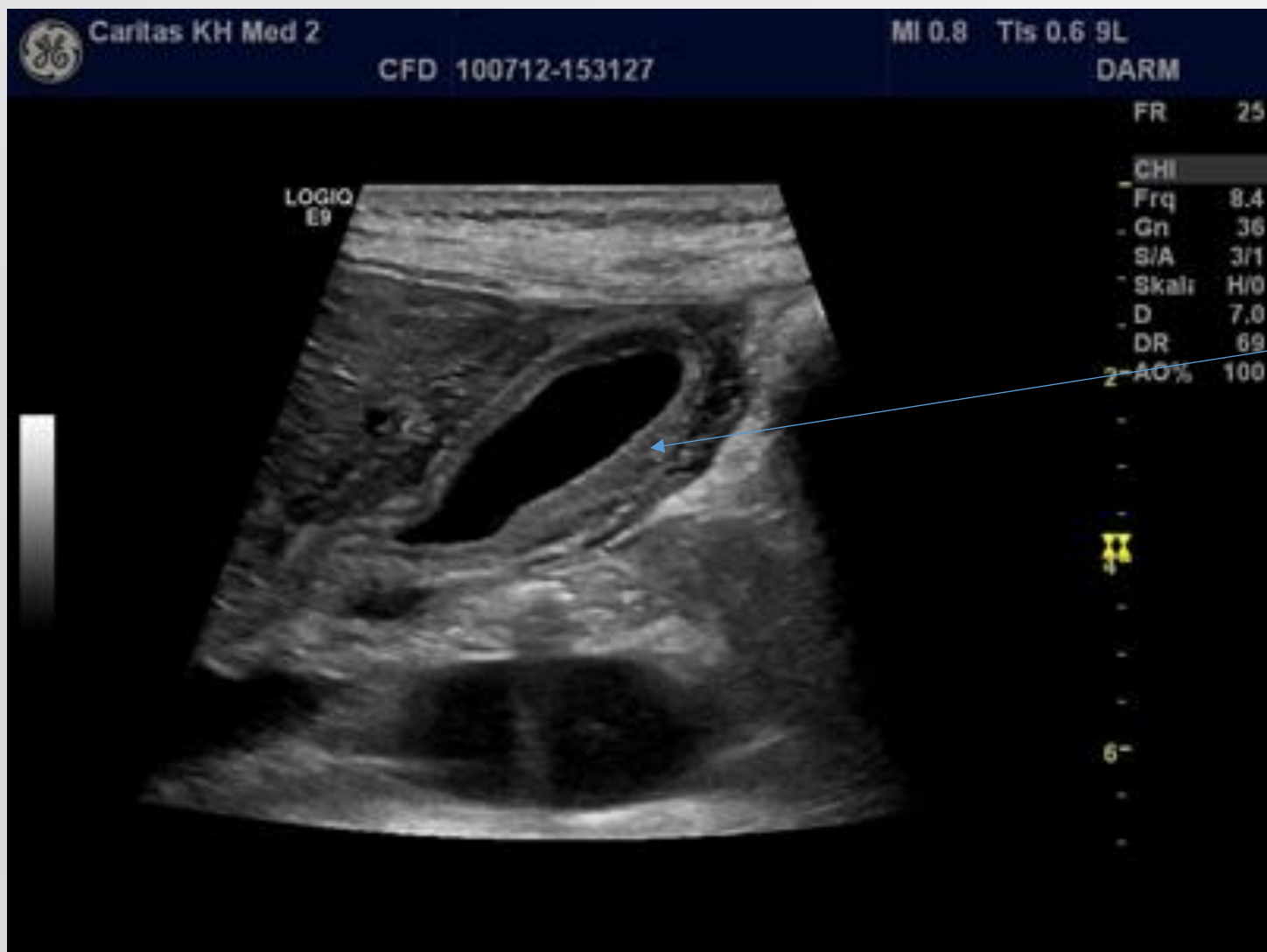
<https://upload.wikimedia.org/wikibooks/de/thu mb/0/0e/Gallen~4.png/220px-Gallen~4.png>



[http://www.auntminnie.com/user/images/content_i mages/nws_rad/2008_04_22_16_43_33_706.jpg](http://www.auntminnie.com/user/images/content_images/nws_rad/2008_04_22_16_43_33_706.jpg)

Ultrasound findings

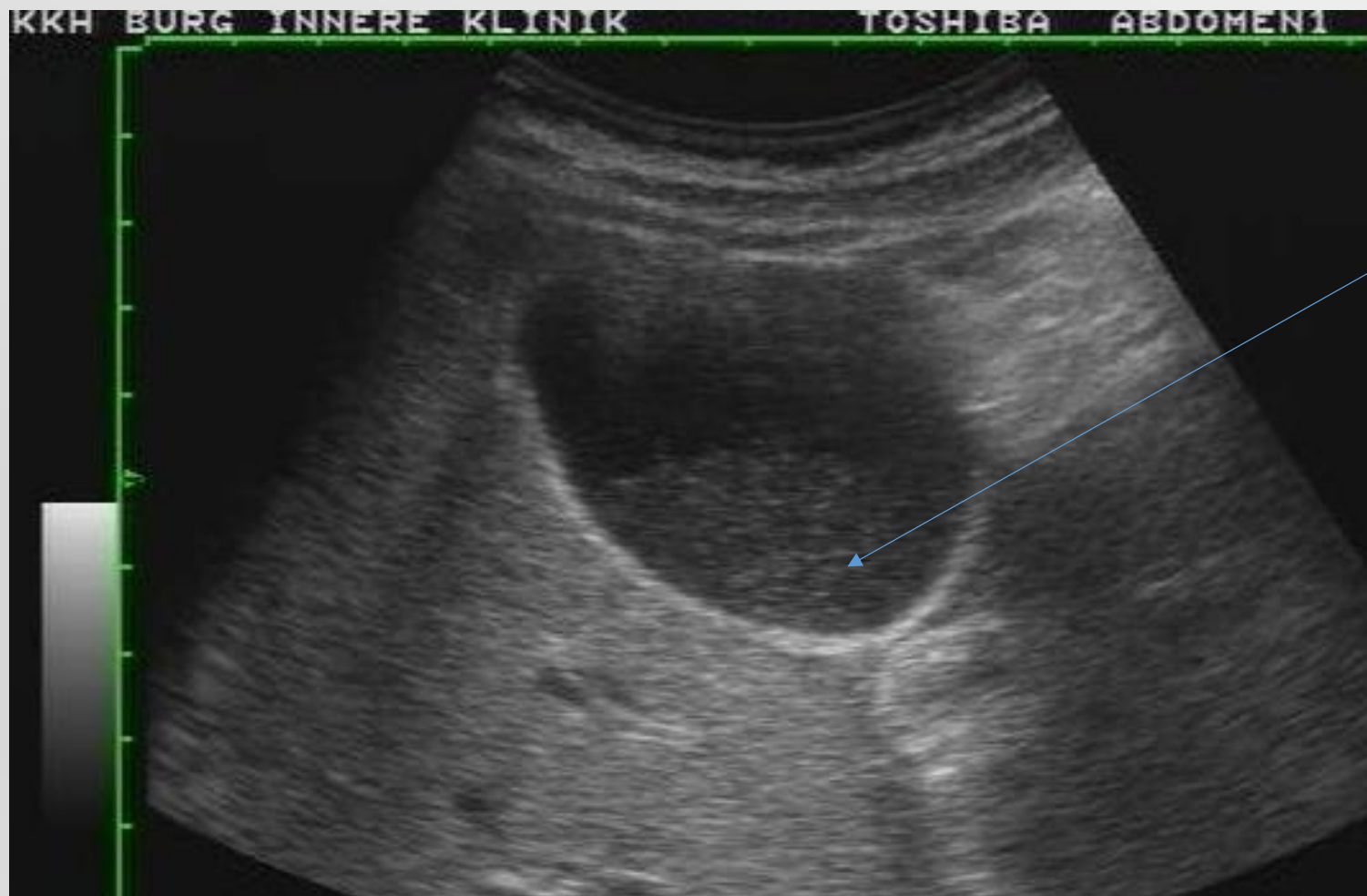
- Increased wall thickness on $> 3\text{mm}$ (postprandial $> 5\text{mm}$)
- 3 layerdness
- Sludge/Stones within the gall bladder
- Pericholecystic fluid
- Distended gallbladder
- Common bile duct dilatated $> 7\text{mm}$

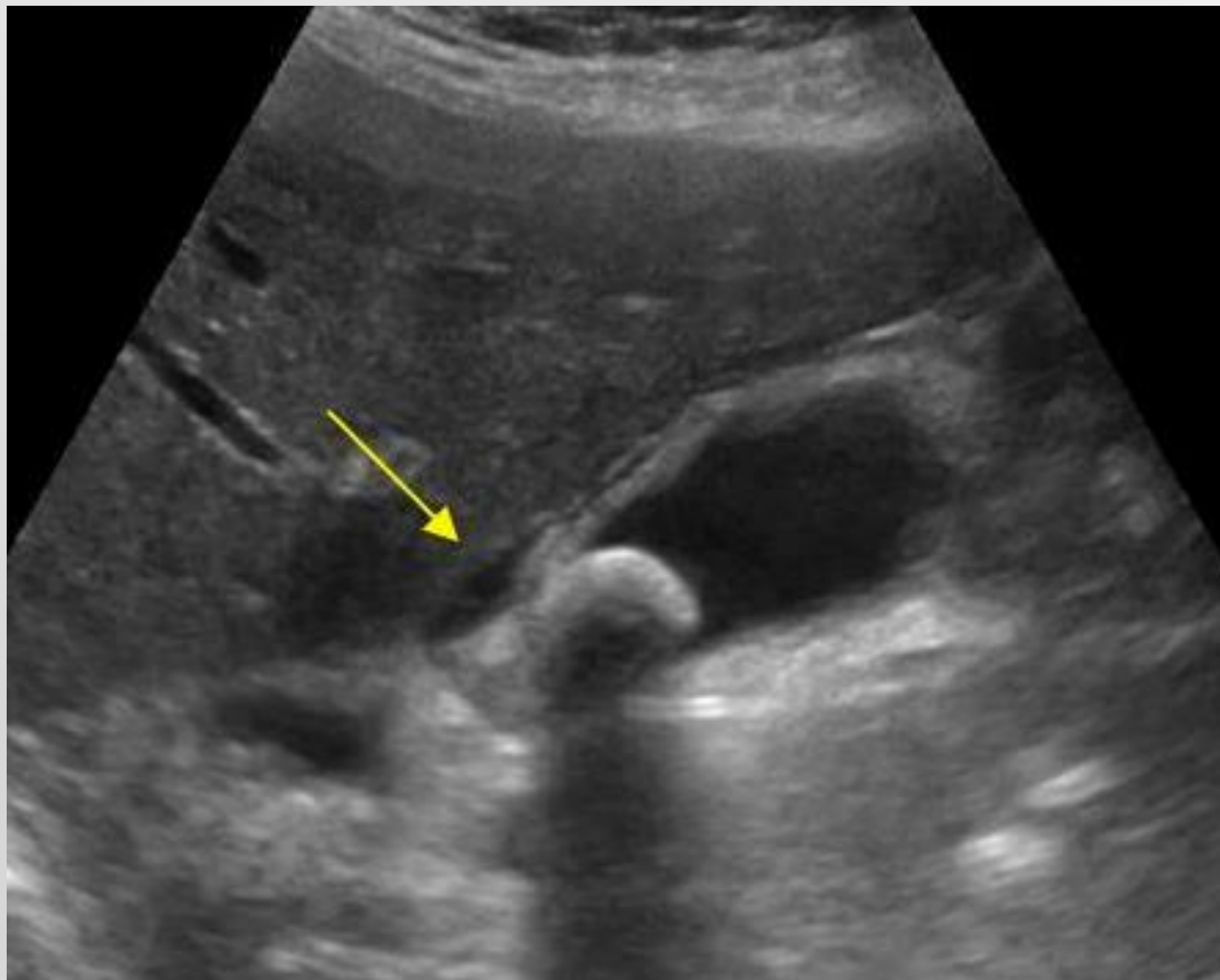


Grossly thickened cystic wall, 3-layeredness

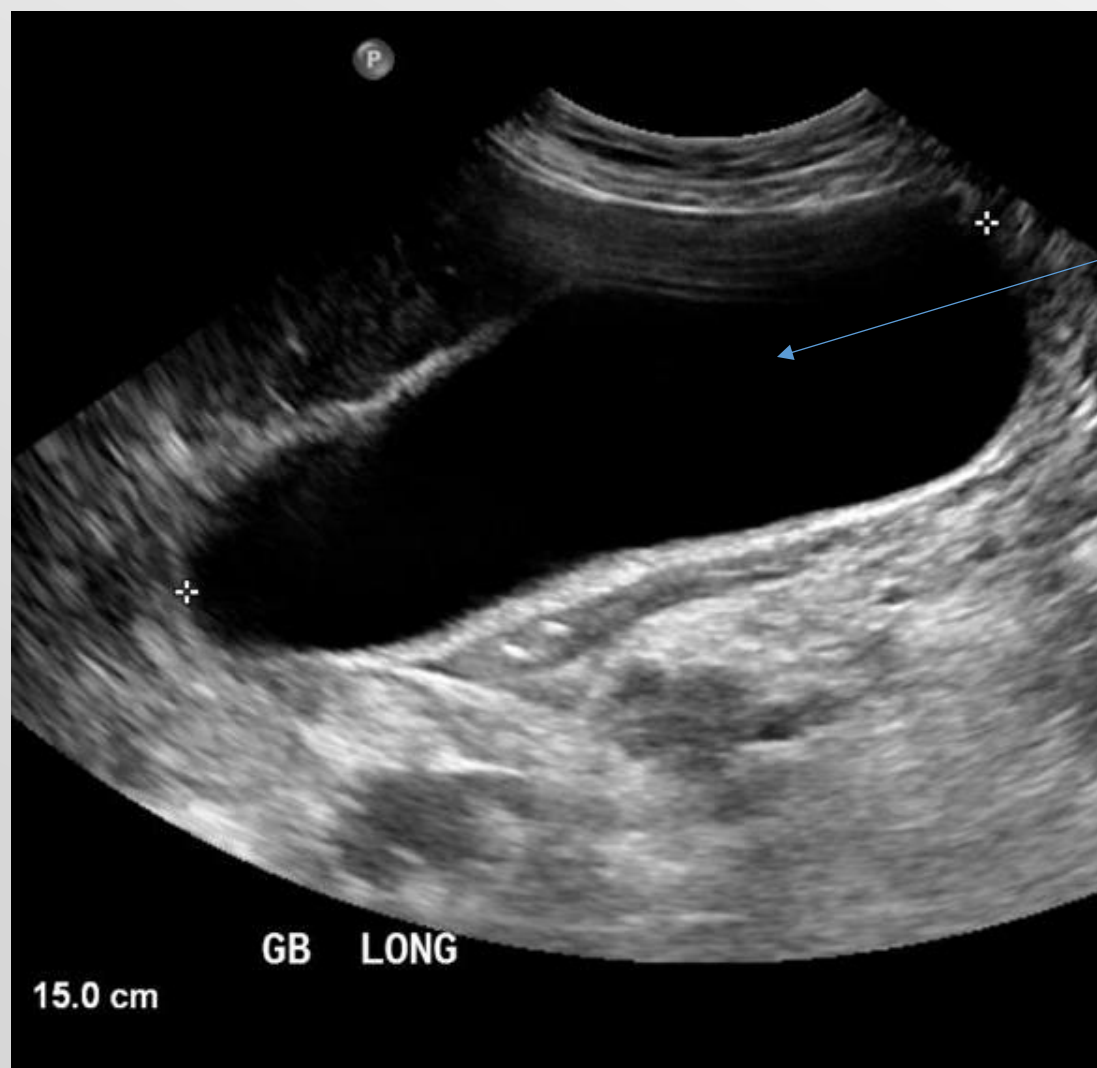


Multiple gallstones





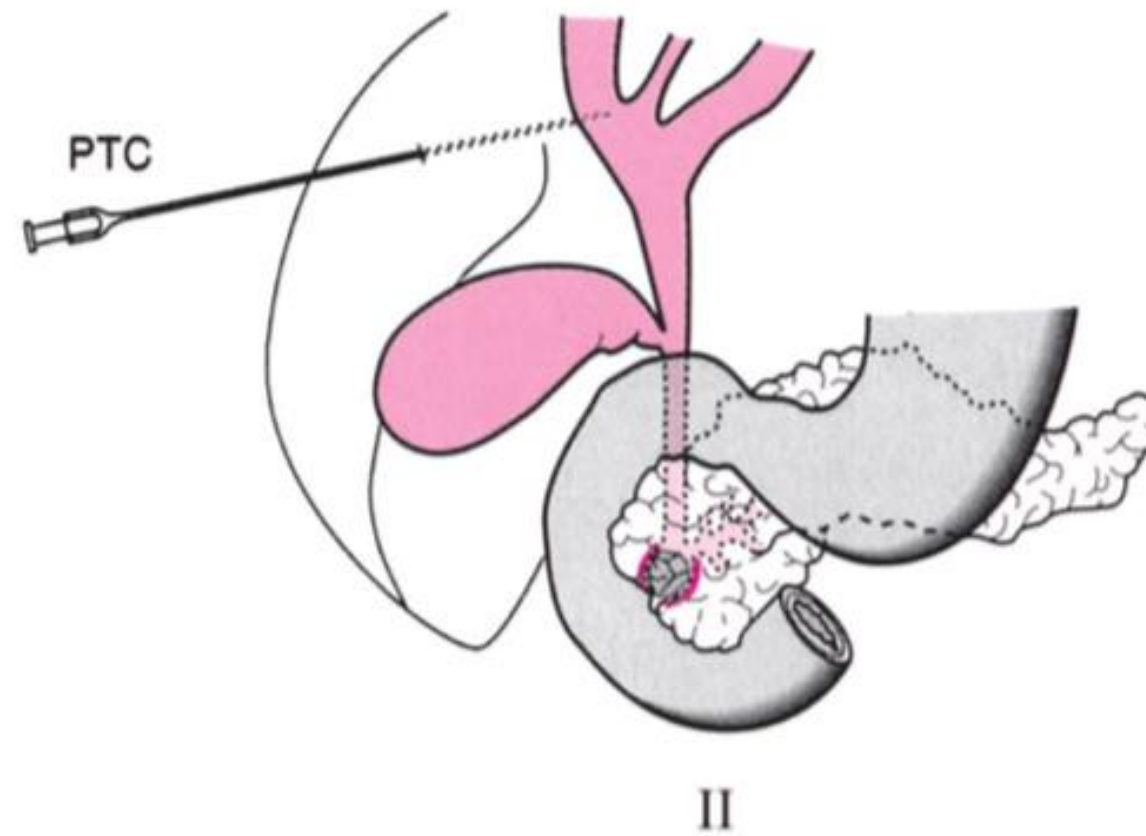
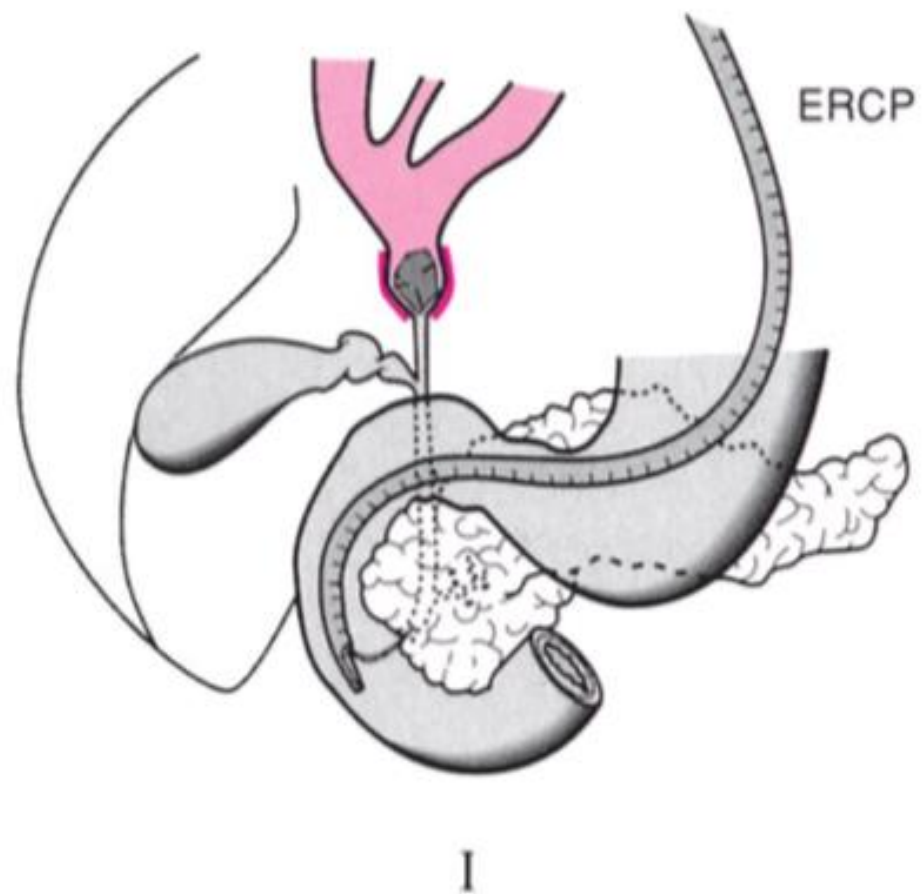
Pericholecystic fluid



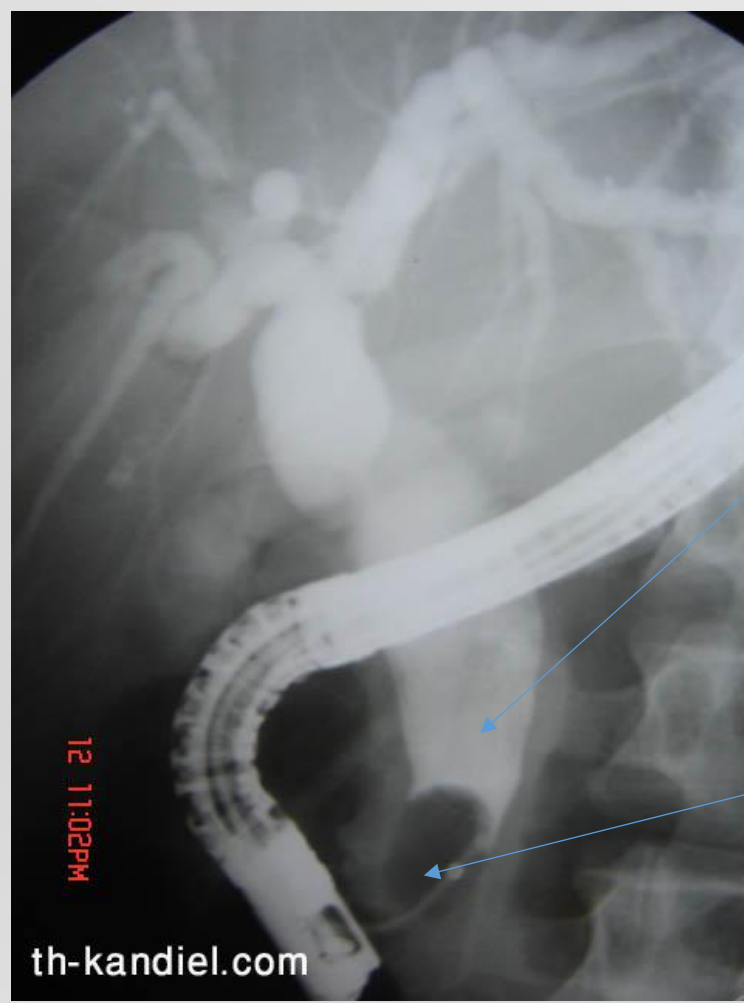
Distended gall bladder

Case history

- Therapy:
 - Question 1: Surgery as first-line therapy vs. second-line?
 - Large trial by Gutt el al: Surgery within 24h of admission is superior to conservative management!
 - Question 2: Open vs. laparoscopic operation?
 - Lap!! Conversion rates of approx 5% depending on severity
(Selmani R, Karagjozov A, Stefanovska V. Conversions in laparoscopic cholecystectomy in acute versus chronic cholecystitis. *Prilozi*. 2013. 34(2):43-50)
- Alternatively: **ERCP or percutaneous drainage**



ERCP

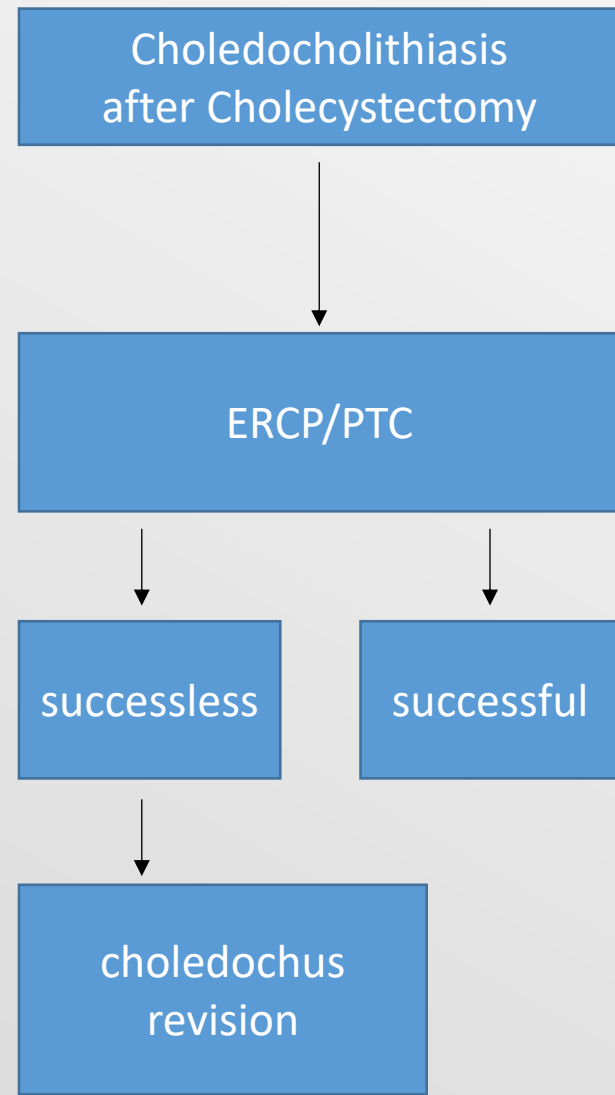
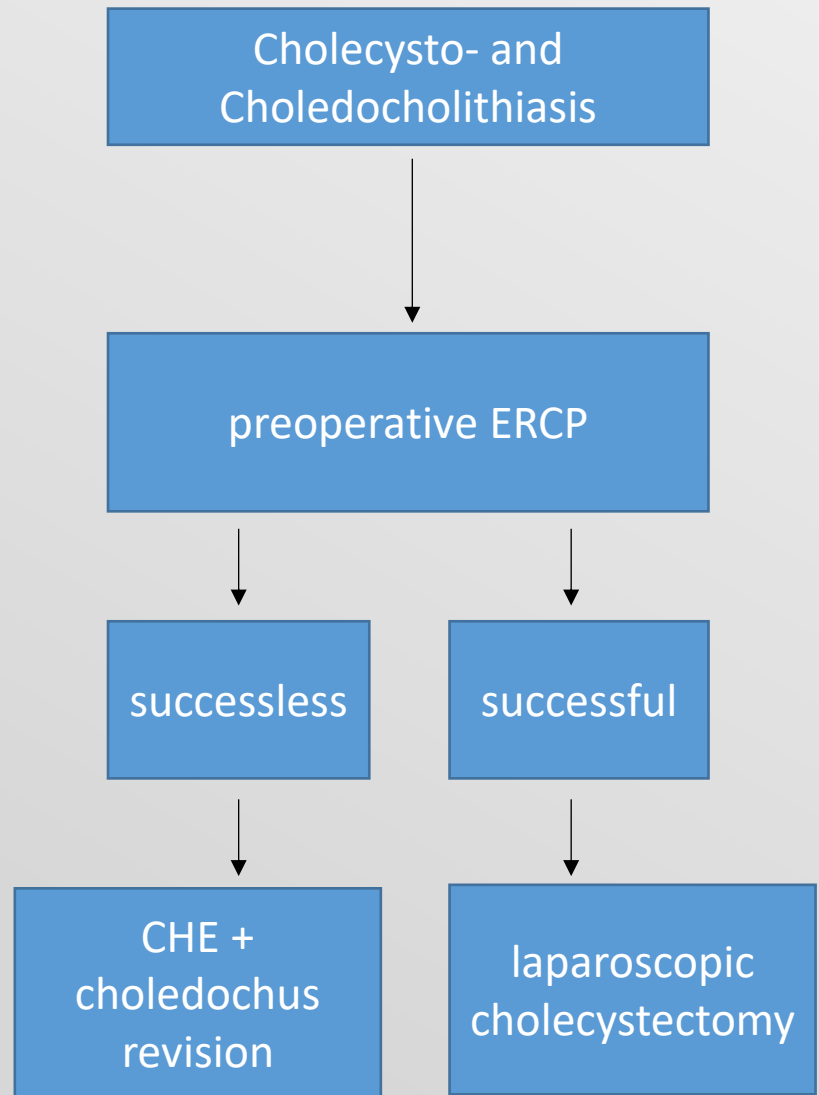
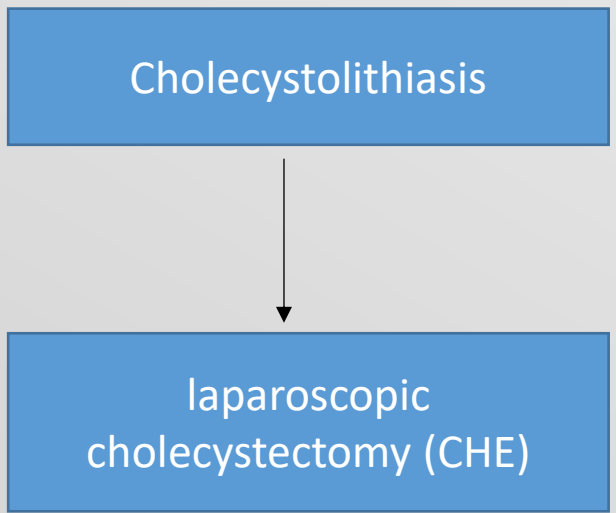


Massive dilation

Massive stone

PTC





Differential diagnosis ???

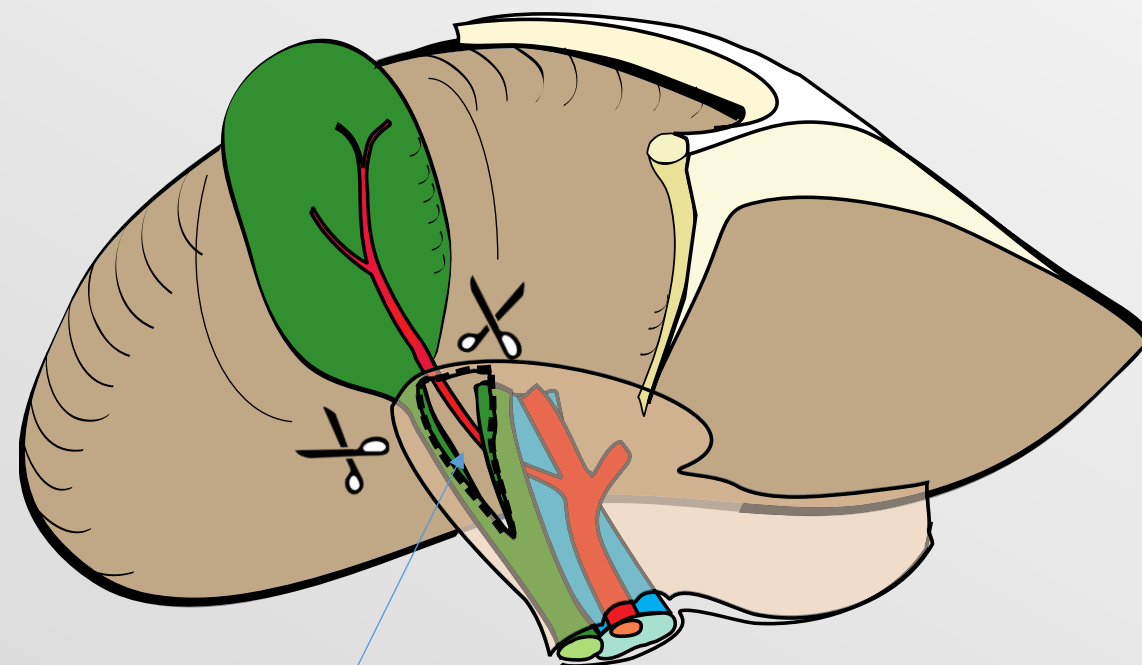
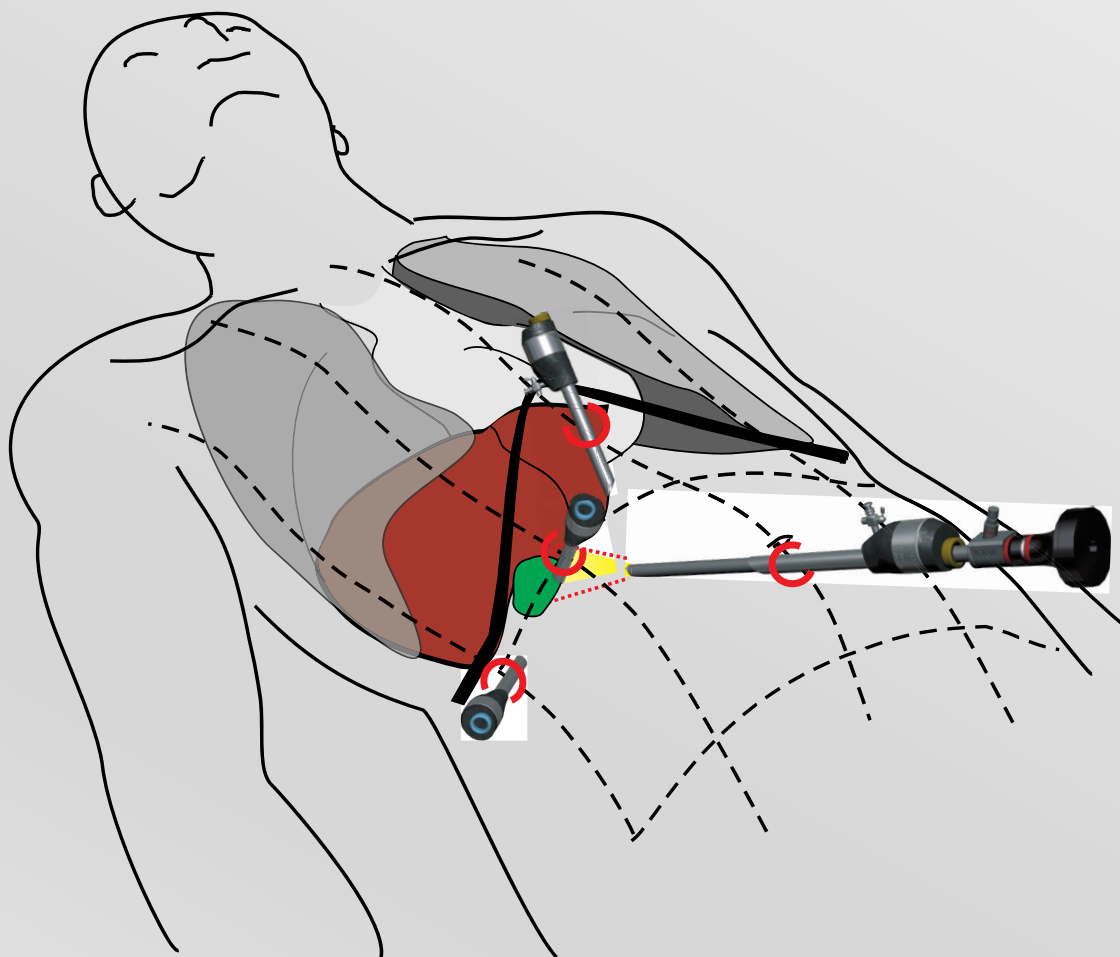


<http://www.blog.heidefarmen.de/wp-content/uploads/2013/02/fragezeichen.jpg>

Differential diagnosis

- Gastric/duodenal ulcers
- Pancreatitis
- Hernia
- Enteritis
- Heart attack
- Mesenterial infarct
- Nephrolithiasis

Laparoscopic cholecystectomy



Calot triangle

Video: Laparoscopic cholecystectomy



Complications: Laparoscopic cholecystectomy

- Bleeding
 - Cystic artery
 - Hepatic artery
 - Gallbladder base

→ Clips/coagulation
- Injury of biliary tract

→ Stop operation, abdominal drainage
transfer to hepatobiliary centre
- Injury of duodenum

→ Sewing

Complications: Laparoscopic cholecystectomy

- Peritonitis → Operation
- Fistula → Endoprothetics
- Biliary stump insufficiency → Operation



**THANKS FOR
YOUR ATTENTION
AND
PLEASE DON'T ASK
TOO MUCH**