

GALLSTONE DISEASE: THE BIG PICTURE

UNR ECHO PROJECT
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DEFINITIONS

- ▶ **CHOLELITHIASIS** = stones or sludge in the gallbladder
- ▶ **CHOLEDOCHOLITHIASIS** = stones/sludge in the bile ducts
- ▶ **CHOLECYSTITIS** = inflamed gallbladder usually in the presence of stones or sludge
- ▶ **CHOLANGITIS** = stasis and infection in the bile ducts as a result of stones, benign stenosis, or malignancy
- ▶ **GALLSTONE PANCREATITIS** = acute pancreatitis related to choledocholithiasis with obstruction at the papilla

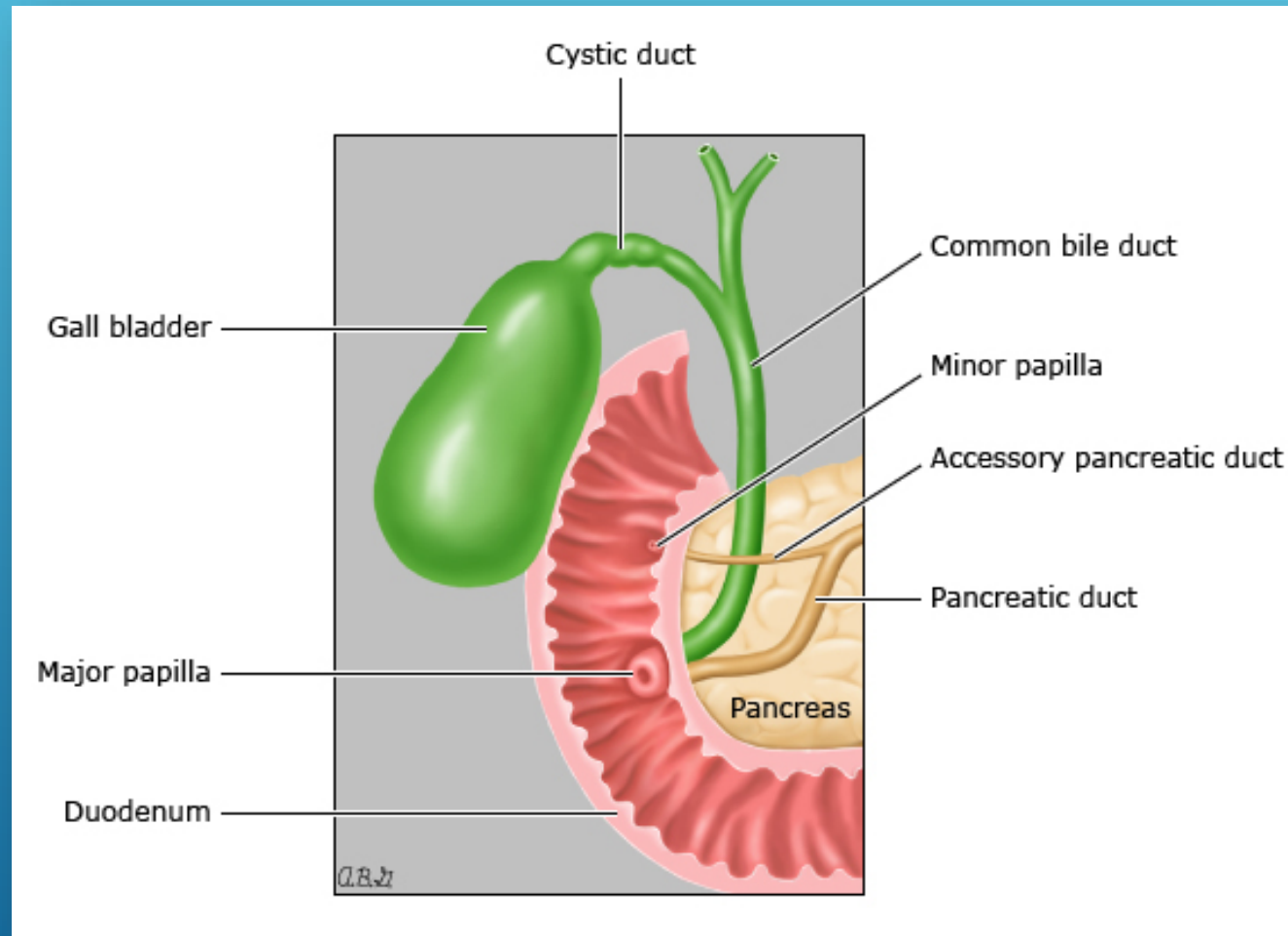


GALLBLADDER AND BILIARY ANATOMY

- ▶ Gallbladder
- ▶ Cystic Duct
- ▶ Right and Left Intraheptics
- ▶ Common Hepatic Duct
- ▶ Common Bile Duct
- ▶ Ampulla of Vater
- ▶ Major Papilla



BILIARY ANATOMY



GALLSTONE EPIDEMIOLOGY

- A common and costly disease
- US estimates are 6.3 million men and 14.2 million women between ages of 20-74.
- Prevalence among non-Hispanic white men and women is 8-16%.
- Prevalence among Hispanic men and women is 9-27%.
- Prevalence among African Americans is lower at 5-14%.
- More common among Western Caucasians, Hispanics and Native Americans
- Less common among Eastern Europeans, African Americans, and Asians



GALLSTONE RISK FACTORS

- Ethnicity
- Female > Male
- Pregnancy
- Older age
- Obesity
- Rapid weight loss/bariatric surgery



GALLSTONES: NATURAL HISTORY

- 15%-20% will develop symptoms
- *Once symptoms develop, there is an increased risk of complications.
- Incidental or silent gallstones do not require treatment.
- Special exceptions due to increased risk of gallbladder cancer: Large gallstone > 3cm, porcelain gallbladder, gallbladder polyp/adenoma 10mm or bigger, and anomalous pancreatic duct drainage



GALLSTONES: CLINICAL SYMPTOMS

- Biliary colic which is a misnomer and not true colic
- Episodic steady epigastric or RUQ pain often radiating to the R scapular area
- Peaks rapidly within 5-10 minutes and lasts 30 minutes to 6 hours or more
- Frequently associated with N/V
- Fatty meal is a common trigger, but symptoms may occur day or night without a meal.



GALLSTONES: ATYPICAL SYMPTOMS

- R chest pain
- RLQ pain
- Pain in general doesn't cross the midline.
- Bloating and distension
- Postprandial fullness/early satiety
- "Heartburn"



GALLSTONES: PHYSICAL EXAM

- Nonspecific
- Normal abdomen
- RUQ pain
- Murphy's sign refers to acute cholecystitis.



GALLSTONES: LAB EXAM

- Usually normal
- If leukocytosis is present, consider acute cholecystitis.
- If liver enzymes are elevated, consider choledocholithiasis.



GALLSTONE DIAGNOSIS

- Ultrasound (US)- widely available, inexpensive, no radiation
- Gallbladder stones, gravel, and sludge are all managed similarly.
- US has an 84% sensitivity and a 99% specificity.
- A negative US can be repeated in a few weeks if symptoms are consistent with biliary colic.
- A CCK-HIDA can be obtained if US is negative and gallbladder is still suspect.
- CT insensitive- will miss most stones or sludge which are isodense with bile



GALLSTONE TREATMENT

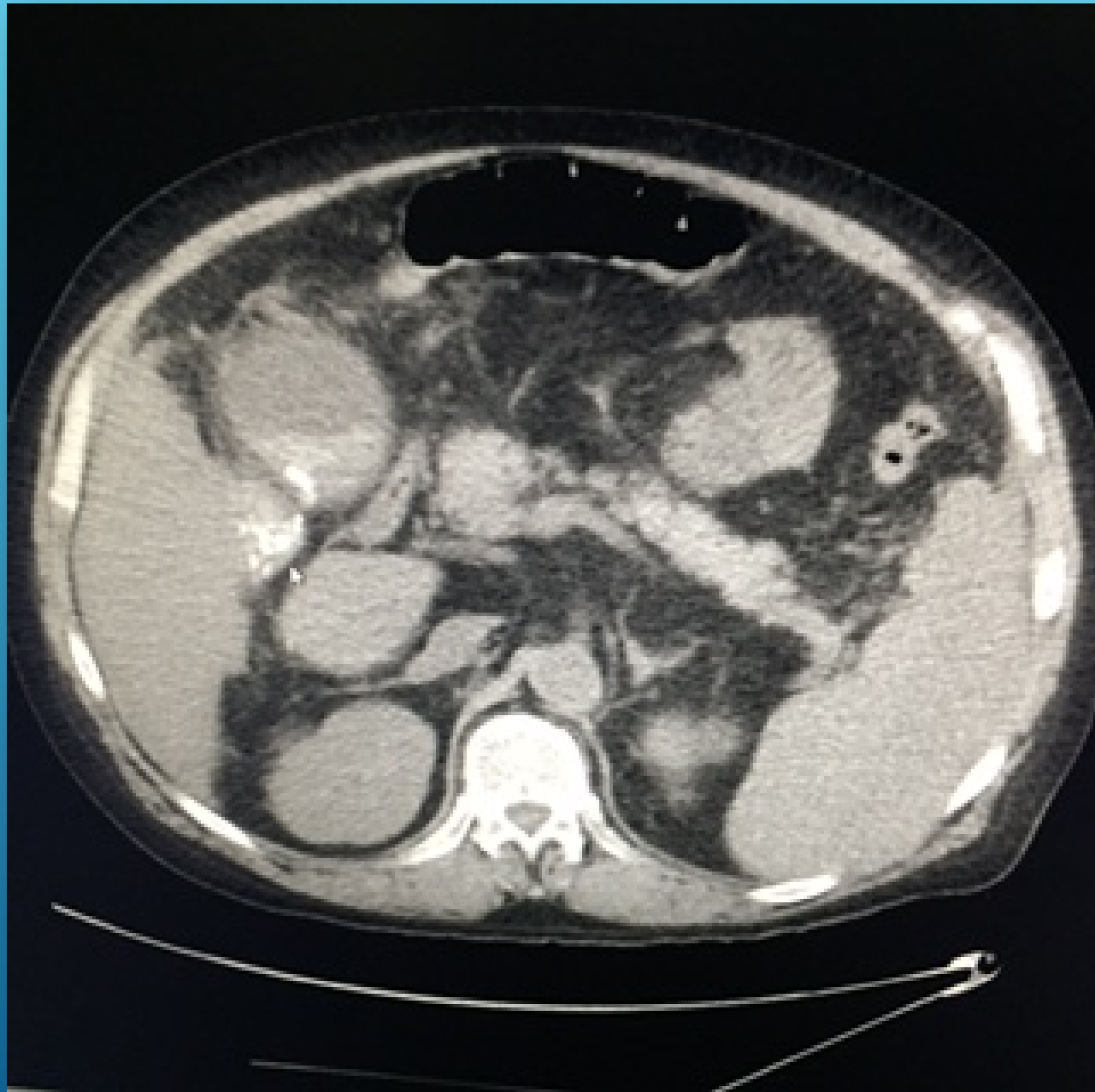
- Asymptomatic gallstones require no treatment except for the exceptions mentioned earlier.
- Treatment for symptomatic stones is pain control with ketorolac or narcotic and surgical referral once stones or sludge become symptomatic.
- Once stones become symptomatic, patients are at increased risk of serious complications such as cholangitis or gallstone pancreatitis.
- Gallstone dissolution therapy rarely done nowadays but ursodiol has been used



SOMETIMES THINGS GET COMPLICATED: ACUTE CHOLECYSTITIS

- Syndrome of RUQ pain, fever, leukocytosis and gallbladder inflammation/wall edema on imaging are usually related to stones or sludge.
- Life threatening complications are gallbladder perforation and/or gangrene.





ACUTE CHOLECYSTITIS TREATMENT

- Hospital admission for supportive care, antibiotics, and surgical therapy depending on the patient's condition
- Suspected gangrene or perforation requires emergency cholecystectomy or percutaneous drainage (e.g. IR cholecystostomy).
- Mortality average 3% with a range of 1%-10%



CHOLEDOCHOLITHIASIS = BILE DUCT STONES

- Most often due to passage of gallstone(s) into bile duct
- Primary choledocholithiasis can occur due to stasis and lithogenic bile.
- 5-25% of patients going to cholecystectomy for gallstones will have choledocholithiasis (AKA CBD stones) with an average of 15%.
- Choledocholithiasis can cause trouble and needs to be addressed- usually endoscopically



CHOLEDOCHOLITHIASIS: SYMPTOMS

- May be asymptomatic but most have symptoms
- Epigastric or substernal chest pain
- Nausea and vomiting
- Obstructive jaundice
- Acute cholangitis: Charcot's triad = RUQ pain, fever, jaundice; sepsis may lead to hypotension and altered mental status (Reynold's Pentad)
- Longstanding low grade biliary obstruction may lead to liver fibrosis and secondary biliary cirrhosis.



CHOLEDOCHOLITHIASIS: DIAGNOSIS

- Labs: Elevated liver enzymes raise suspicion. ALT more sensitive than AST and can go as high as 1,000
- CBC and lipase should be obtained.
- CT and US are insensitive. May show dilated duct > 6mm
- MRCP and ERCP are sensitive, but both are expensive and ERCP is invasive.

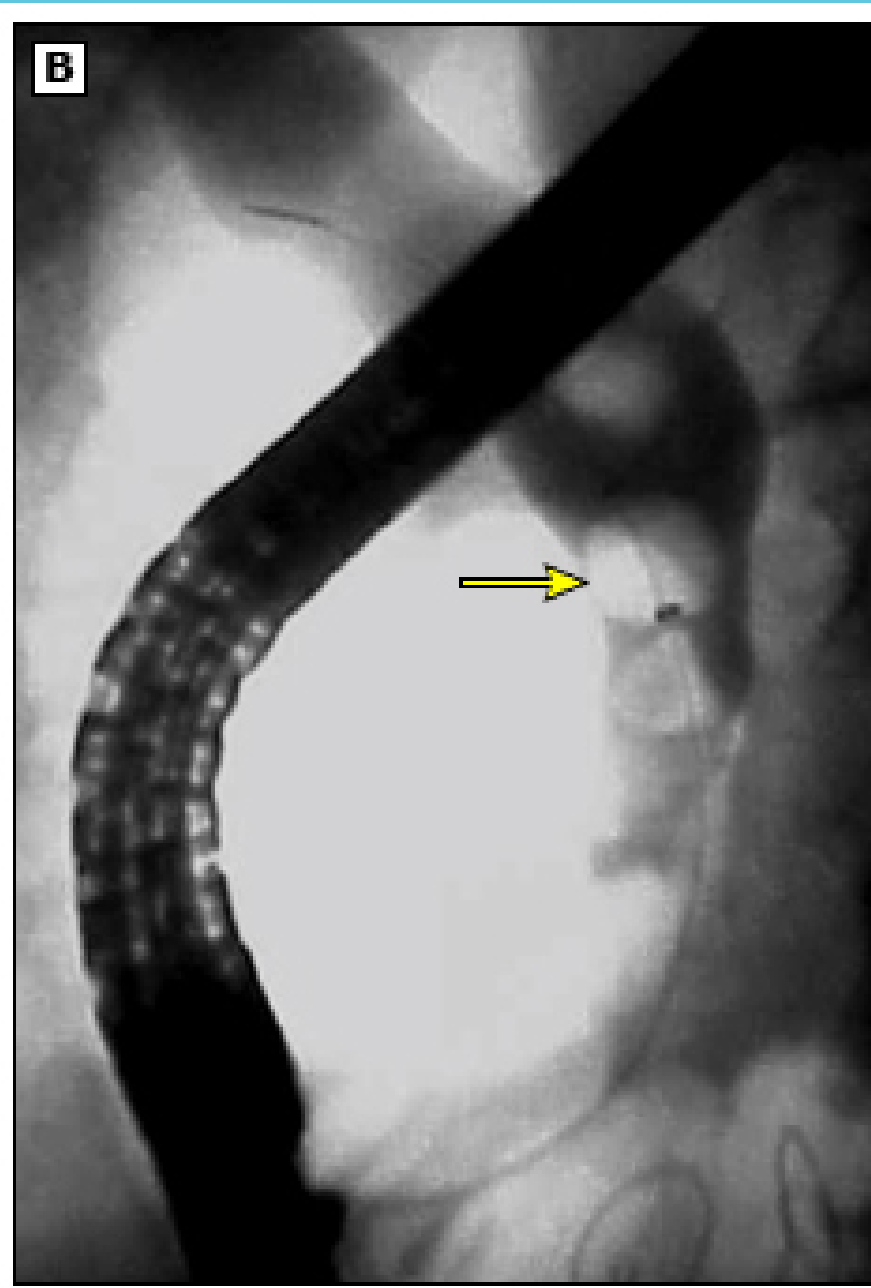
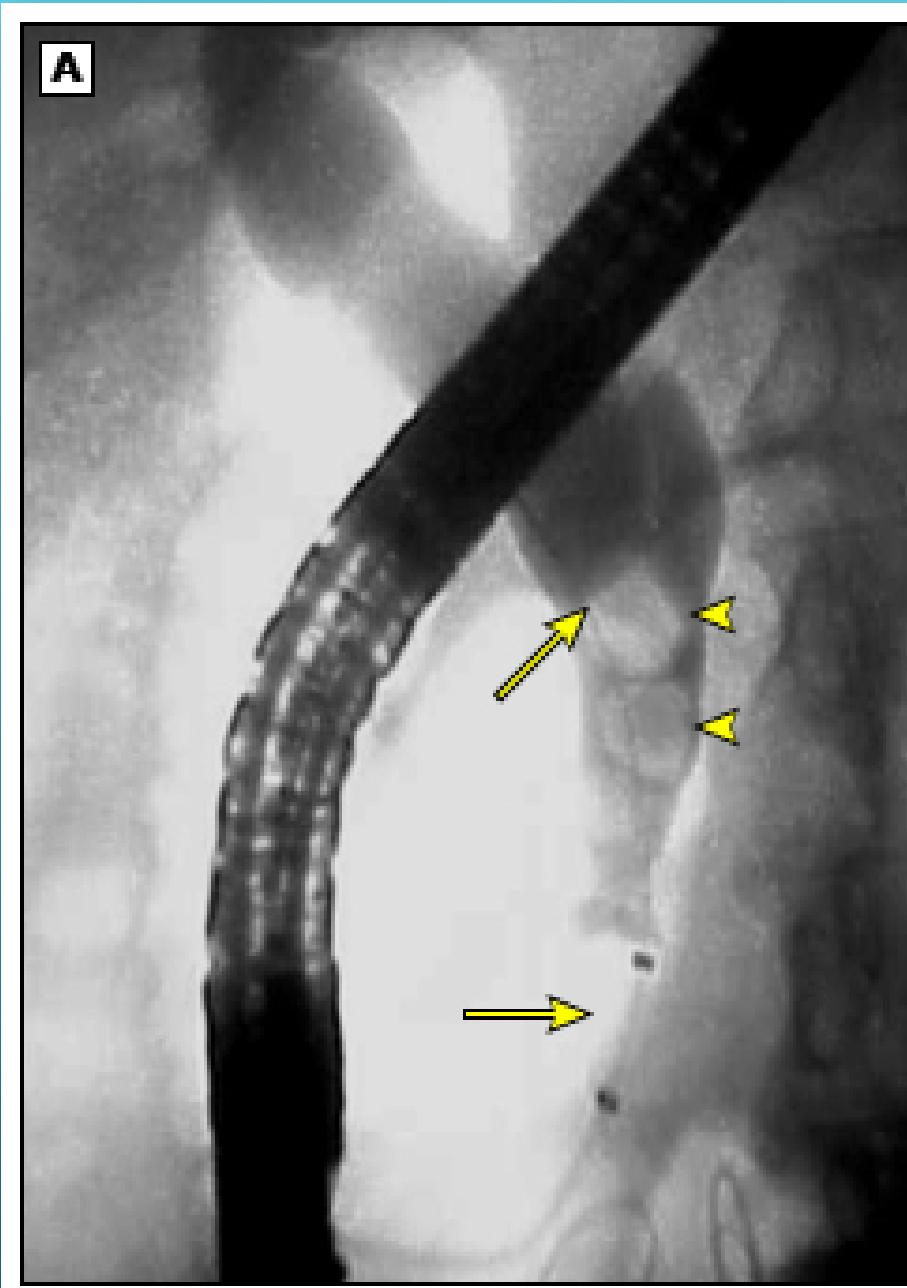


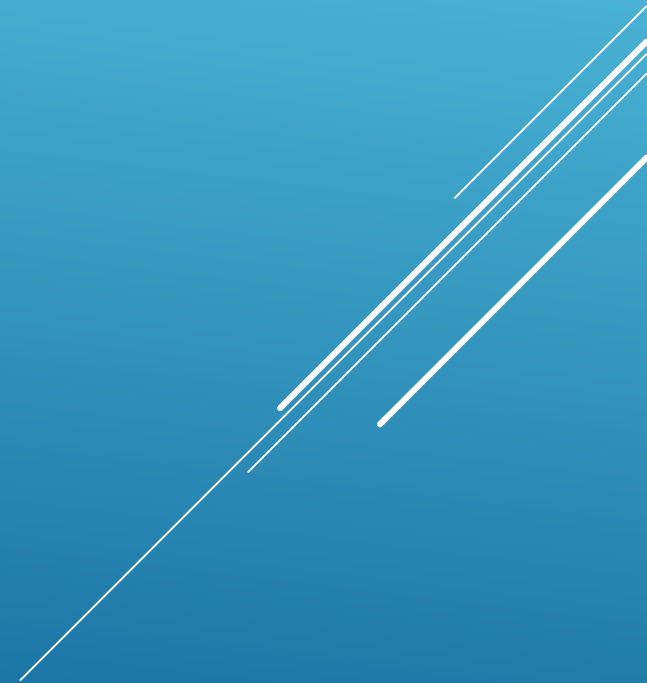
CHOLEDOCHOLITHIASIS: TREATMENT

- Risk stratification
- High risk patients- proceed with ERCP and stone removal
- Intermediate risk patients don't justify risk of ERCP pancreatitis (5%). MRCP or EUS will diagnose bile duct stones.
- Low risk patients- laparoscopic cholecystectomy with IOC
- Renown protocol is lap cholecystectomy with IOC for intermediate risk patients. Avoids delay of ERCP or MRCP









CHOLEDOCHOLITHIASIS: COMPLICATIONS

ACUTE CHOLANGITIS

- Requires aggressive treatment; patients are often septic
- Resuscitation with IV hydration
- IV antibiotics: Zosyn or quinolone + metronidazole
- Urgent drainage with either ERCP or if too ill for ERCP, percutaneous transhepatic drainage by IR (PTC)
- 70-80% will respond to support and IV antibiotics
- Mortality is 11% in severe cases
- Cholecystectomy can be done once patient stabilizes if gallstones are present



GALLSTONE PANCREATITIS

- Acute pancreatitis related to ampullary obstruction by stones or sludge, although the exact mechanism is unknown
- Syndrome of acute pancreatic inflammation characterized by abdominal pain with elevated liver and pancreatic enzymes
- Represents 35-40% of pancreatitis cases worldwide but 80-90% of cases of pancreatitis in my practice



GALLSTONE PANCREATITIS: RISKS

- Presence of gallstones especially small stones which can escape the gallbladder
- Risks increase when stones become symptomatic.
- Small stones, 5mm or less, are more likely to escape the gallbladder and lodge or pass out of the ampulla into the duodenum.



GALLSTONE PANCREATITIS: DIAGNOSIS

- Steady, unrelenting upper abdominal pain often with nausea and vomiting
- Elevated amylase or lipase; lipase more specific
- Elevated liver enzymes; ALT > 150 has a 95% positive predictive value
- US demonstrating gallbladder stones or sludge



GALLSTONE PANCREATITIS: MANAGEMENT

- Assessment of disease severity
- 75% will have mild interstitial disease and a milder course.
- 25% will have necrosis and a longer more difficult course.
- Aggressive IV hydration and narcotic analgesia are the keystones of treatment.
- MRCP can be done to look for CBD stone if liver enzymes are not improving. Best to avoid early ERCP if possible
- ERCP or percutaneous drainage is mandatory if there is concurrent cholangitis.

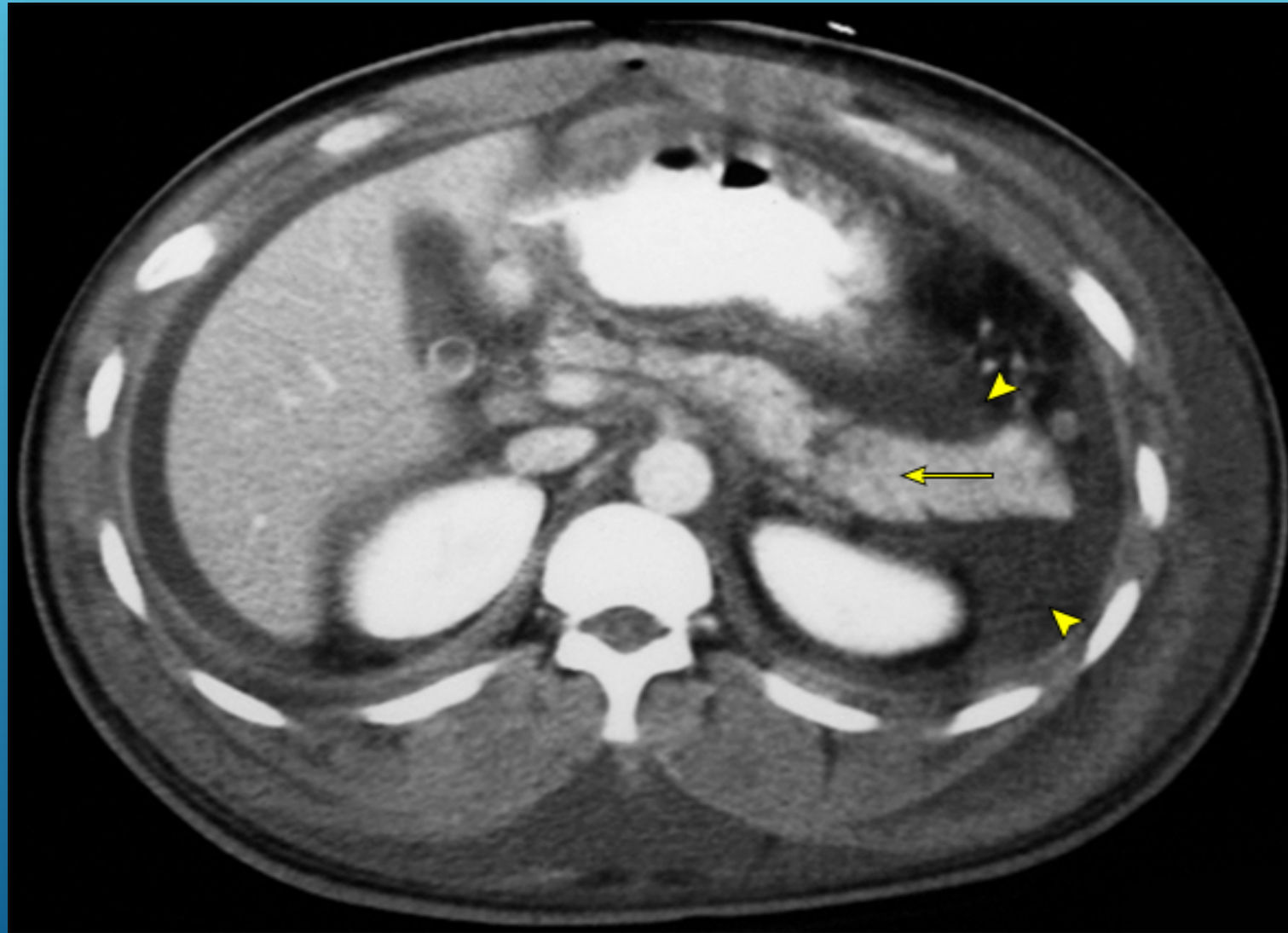


GALLSTONE PANCREATITIS: MANAGEMENT

- No need for CT scan if benign course with rapid improvement
- CT ideally in 2-3 days for sicker patients to assess for pancreatic necrosis; IV and oral contrast best but protect the kidneys
- Avoid prophylactic antibiotics but treat if suspected infection
- ERCP can be delayed if no cholangitis and if CBD stones are suspected. Ideally should be done preoperatively
- ERCP not indicated if liver enzymes are improving and patient is improving; can worsen pancreatitis and can be difficult due to duodenal edema



CT SCAN: GALLSTONE PANCREATITIS



GALLSTONE PANCREATITIS: MANAGEMENT

- Cholecystectomy should be done ideally once pancreatitis subsides. Timing is controversial and some surgeons prefer to wait 6 weeks to allow edema to resolve.
- Delayed cholecystectomy is associated with a 25-30% risk of recurrent gallstone pancreatitis, cholecystitis, or cholangitis within the next 6-18 weeks.

