Gallbladder and Biliary tract disease

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RUQ Pain
Acute RUQ Pain

- Acute Cholecystitis — most common

- Differential Diagnosis
  - Choledocholithiasis
  - Peptic Ulcer Disease
  - Acute hepatitis
  - Liver abscess
  - Right sided pneumonia
  - Right renal calculi
RUQ Pain
Imaging Evaluation

- Ultrasound – 1st
- CT – 2nd
- Nuclear Medicine Hepatobiliary scan (HIDA)
- MRI/MRCP
  - Excellent for biliary duct disease
Cholelithiasis
Same patient, same day
Cholelithiasis on US vs. CT
What causes gallstones?

- **Excess cholesterol** may form into crystals and eventually into stones.
- **Too much bilirubin** contributes to gallstone formation. Seen in liver cirrhosis, biliary tract infections and certain blood disorders.
- **If the gallbladder doesn't empty correctly** (doesn't empty completely or often enough), bile may become very concentrated, which contributes to the formation of gallstones.
Who is at risk for gallstones?

- Female
- Over age 60
- Native American or Latino
- Overweight
- Being pregnant
- High-fat or a high-cholesterol diet
- Family history of gallstones
- Diabetes
- Some medications
Acute cholecystitis pathophysiology

• 90 – 95% have stones
• Obstruction at the neck or cystic duct
• Variable degrees of infection and necrosis
• RUQ pain. Referred pain to the right shoulder
US diagnosis in acute cholecystitis

- Accuracy is 88%. Similar to nuclear medicine scintigraphy
- Quick.
- No radiation
- Can look for other pathologies
US in Acute Cholecystitis

- Most sensitive findings
  - Gallstones with maximal tenderness over US localized gallbladder (sonographic Murphy’s sign).
  - Distended gallbladder
  - Obstructing stone in gallbladder neck or cystic duct
- Secondary signs
  - Gallbladder wall thickening
    - Normal < 3 mm
    - Equivocal 3-5 mm
    - Abnormal > 5 mm
  - Pericholecystic fluid
Acute cholecystitis example
CT comparison
Acute cholecystitis example
How do Nuclear Medicine hepatobiliary (HIDA) scans work?

- A radioactive tracer is injected into a vein in the arm.
- The liver removes the tracer from the bloodstream and adds it to the bile.
- The tracer exits through the intrahepatic bile ducts and enters the gallbladder.
- The gallbladder contracts and sends the tracer into the common bile duct.
- The tracer travels from the CBD into the small bowel.
Normal HIDA
Acute cholecystitis
Be reluctant to call acute cholecystitis without gallbladder distension
Potential pitfall

- Gallbladder wall thickening
- Acute hepatitis
Gallbladder wall thickening

- Low protein states
- Ascites
- Hepatitis
- Cirrhosis
- Congestive heart failure
- Renal failure
- Adenomyomatosis
Potential pitfall

- Pericholecystic fluid
- Free fluid related to a perforated duodenal ulcer
Gangrenous cholecystitis

- Look for asymmetric wall thickening and intraluminal membranes
Gallbladder perforation

- 19-24% mortality
- Look for a pericholecystic abscess
CT scan – gallbladder perforation
Emphysematous cholecystitis

- Rare
- Gas-forming bacteria
- Usually in diabetics and may be silent
- May not have gallstones
- 5X higher risk of perforation
Emphysematous cholecystitis
Emphysematous cholecystitis
Pitfalls – emphysematous cholecystitis versus wall echo shadow sign
Choledocholithiasis

- Ultrasound is sensitive for biliary ductal dilation
Intrahepatic biliary obstruction
Common bile duct dilation
Ascending cholangitis

- Acute bacterial infection of the biliary tree.
- High mortality and emergent biliary decompression is required.
- Charcot’s triad of fever, right upper quadrant abdominal pain, and jaundice, which is seen in ~40%
- Look for thickened biliary ductal walls. Sludge and pus in the ducts
Cholangiocarcinoma
Cholangiocarcinoma

- Malignancy arising from cholangiocytes in the biliary tree.
- Poor prognosis and high morbidity.
- Higher rates seen in southeast Asia.
- Incidence is usually in the elderly (7th decade).
- Slight male predilection.
Gallbladder polyps
Gallbladder polyps

- Recommended follow-up of small polyps (<10 mm) varies from author to author. A commonly accepted strategy includes:
  - ≤6 mm: no further follow up necessary
  - 6-9 mm: follow-up to ensure no interval growth; follow-up interval varies from 3 to 6 months
  - ≥10 mm: surgical consultation
    - usually warrants cholecystectomy
    - if no cholecystectomy, annual follow up is warranted
Adenomyomatosis
Adenomyomatosis (Hyperplastic cholecystosis)

- Cholesterol accumulation in gallbladder wall diverticula (Rokitansky-Aschoff sinuses).
- Female predilection (M:F=1:3).
- Commonly an incidental finding, but associated with gallbladder inflammation.
- No intrinsic malignant potential, and usually requires no treatment.
- Usually asymptomatic. But frequently associated with chronic biliary inflammation and gallstones.
- Three morphological types of adenomyomatosis are described:
  - Fundal (localised)
  - Segmental (annular or hourglass)
  - Generalized (diffuse)
Adenomyomatosis on MRI
Hour glass adenomyomatosis
Fundal adenomyomatosis
Porcelain gallbladder
Porcelain gallbladder

- Extensive calcium encrustation of the gallbladder wall. Describes its appearance at surgery.
- High association between porcelain gallbladder and gallbladder adenocarcinoma (22-30% of porcelain gallbladders developing gallbladder adenocarcinoma).
- Cholecystectomy is recommended.
Gallbladder carcinoma
Gallbladder cancer

Risk factors include:
- chronic cholecystitis
- gallstones are seen in 70-90% of cases
- familial adenomatous polyposis syndrome (FAP) and inflammatory bowel disease (IBD)
- porcelain gallbladder
- gallbladder polyps > 1cm that are sessile and solitary
- Female predilection

Radiographic features
- intraluminal mass
- diffuse mural thickening
- mass replacing the gallbladder (most common presentation)
Gallbladder carcinoma
Take away points

- Be reluctant to call acute cholecystitis without distension
- When you see distension, look hard for obstructing stones
  - In cystic duct or gallbladder neck with gallbladder distension
  - In bile ducts with ductal dilation
- Air verses stones ➔ Shadowing calcifications
- Watch out for gallbladder cancer
Thank you!!!