Biliary Disease

Gallbladder and Biliary Tree

• Imaging Studies Available
  – X-ray
  – Computed tomography
  – Radioisotope scan (hepatobiliary scan)
  – Ultrasound: the most sensitive study for gallstone
Gallstones

• 81% consist of cholesterol and are radiolucent (*cannot* be seen on plain films)
• 19% contain calcium and are radio-opaque (*can* be seen on plain films)

Gallstones

• Size: can be very small (1-2 mm) to very large (several cm)
• Shape: single stone – round, large
• Multiple stones – small, faceted
Gallstones

- Complications include
  - Obstruction of bile duct: commonly cystic duct and common bile duct
  - Cholecystitis (infection/ inflammation of the gallbladder)
  - Abscess (complication of cholecystitis)
  - Perforation:
    - Peritonitis, inflammation infection of peritoneum
    - Gallstone ileus, stone erodes into GI tract and causes obstruction

Gallbladder

- Ultrasound
  - Stones all appear ECHOGENIC (white)
    - May be either radiolucent or radio-opaque
  - Beyond stone is an acoustic shadow
  - Bile is HYPOECHOIC (black)
  - Polyps, neoplasm typically are isoechoic (equal echo density) to adjacent soft tissues
Gallstones

- AP abdomen
- Several facetted calcified densities
- Dense rim less dense center
- Separate from renal calculi and costocartilage by different positions
- Use oblique films, gallbladder anterior so move away from spine

Gallstones

- Ultrasound upper abdomen
- Longitudinal scan
- Round echogenic structures in gallbladder
- Acoustic shadowing
Dilation of Bile Ducts

• Causes include
  – Stone (most common)
  – Carcinoma

Dilated Common Bile Duct

• Longitudinal US through liver hilum
• Typical double channel sign
• Dilated common bile duct (blue arrow) anterior to portal vein (red arrow)
• Duct usually smaller than vein
• Stone (not seen) distal in duct
**Bile Duct Dilatation**

- Axial CT mid-abdomen
- Dilated common bile duct (arrowhead)
- Dilated intrahepatic ducts
- Round fluid structure anterior to kidney is distended gallbladder

**Common Bile Duct Stone**

- Axial imaging lower than prior example
- High density structure obstructing calculi (arrow)
- Large round area gallbladder
HIDA Imaging

- Radionuclide targeted to hepatocytes
- Non filling of the common bile duct or gall bladder indicates obstructive process

Acute Cholecystitis

- No filling of the gallbladder 60 minutes after injection of isotope
- Rapid accumulation within the liver and bile ducts with spill into the duodenum
Bile Leak Ida Scan

Accumulation of isotope outside of the biliary tree

MR Cholangiography Stone

- Emerging technology
- Visualize stone as a filling defect in the common duct (blue arrow)