Biliary Basics

September 7, 2018

Biliary Basics

Topics and goals for today:

1. Understand testing that is avail.
2. Understand indications and contra-indications
3. Understand advantages/disadvantages
4. How to select the best test for specific pt
5. How to avoid pitfalls (and resulting delays/errors)
6. Pt management based on common presentations

NOT discussing:

1. Intra-operative management
2. Labs
3. Antibiotics, fluids, pain, etc

Testing Modalities

- Ultrasound
- CT
- MRI/MRCP
- ERCP
- IOC
- EUS
- PTC
- HIDA
- HIDA with CCK

Ultrasound

Advantages:

1. Portable
2. No radiation exposure
3. Assesses actual anatomy
4. Easily repeatable
5. Relatively inexpensive
6. Good viz of the GB, intrahepatic ducts
7. Good for detecting GB stones

Ultrasound

Disadvantages:

1. Poor viz in obese pts.
2. Typically poor viz of pancreas
3. Typically poor viz of distal CBD/ampulla
4. (+/-) for CBD stones (specific but poorly sensitive.
5. Distal abnormalities are implied by dilated duct
6. Technician dependent

Ultrasound

Gallbladder wall

1. Normal thickness: up to 3mm
    a. Thicker = cholecystitis
    b. Falsely thick in cases of
        - renal failure
        - CHF
        - PD dialysis
        - ascites
    c. Wall can be normal if ischemic

Ultrasound

CBD (Common Bile Duct)

1. Normal width: up to 6-7mm
    a. Can be up to 10mm if labs are normal (esp alkphos)
    b. Can be up to 10mm if previous cholecystectomy
    c. Equation for adding 1mm for each decade > 60
    d. HAVE to correlate with labs

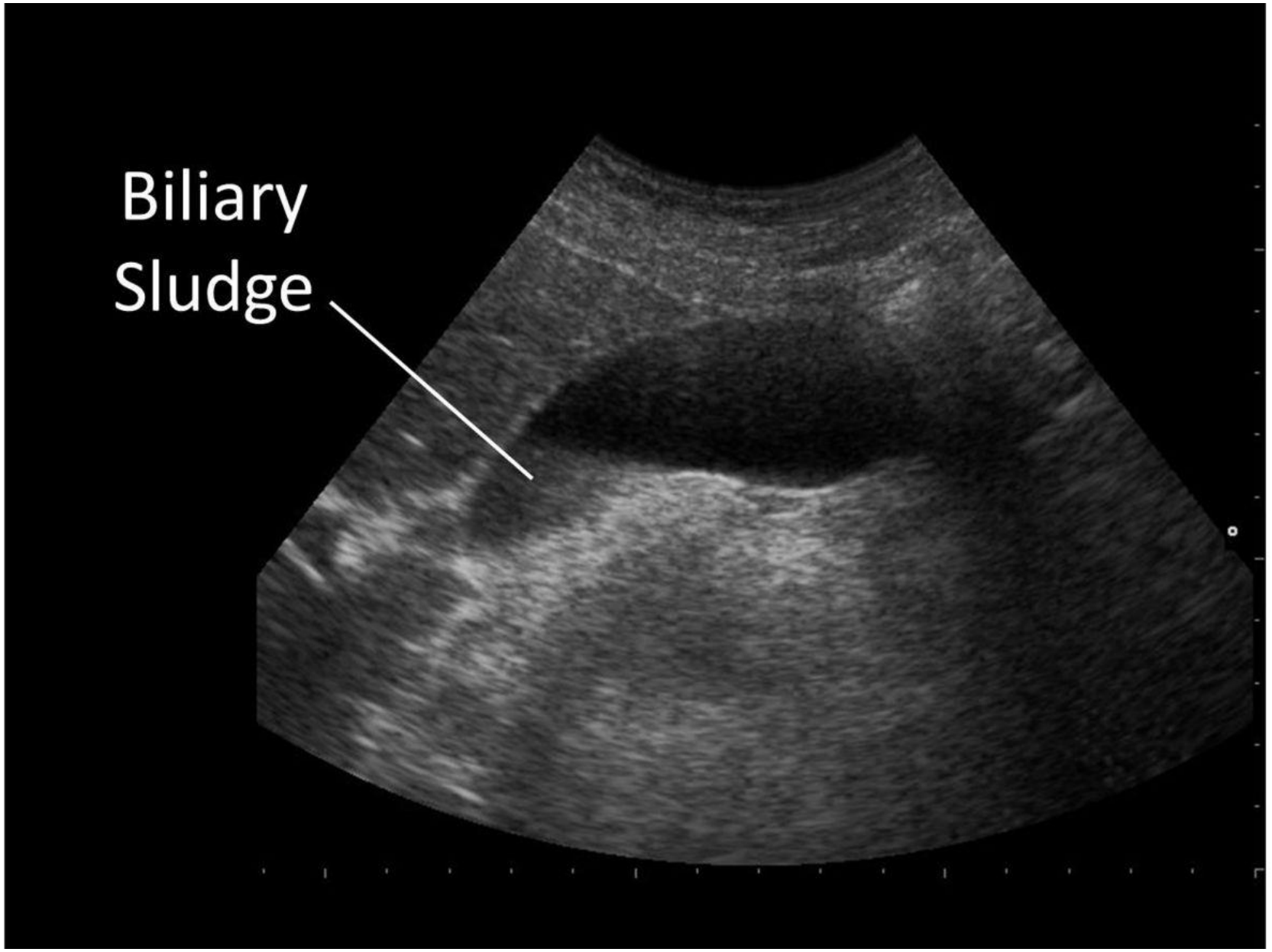
Ultrasound

Sludge vs Stones

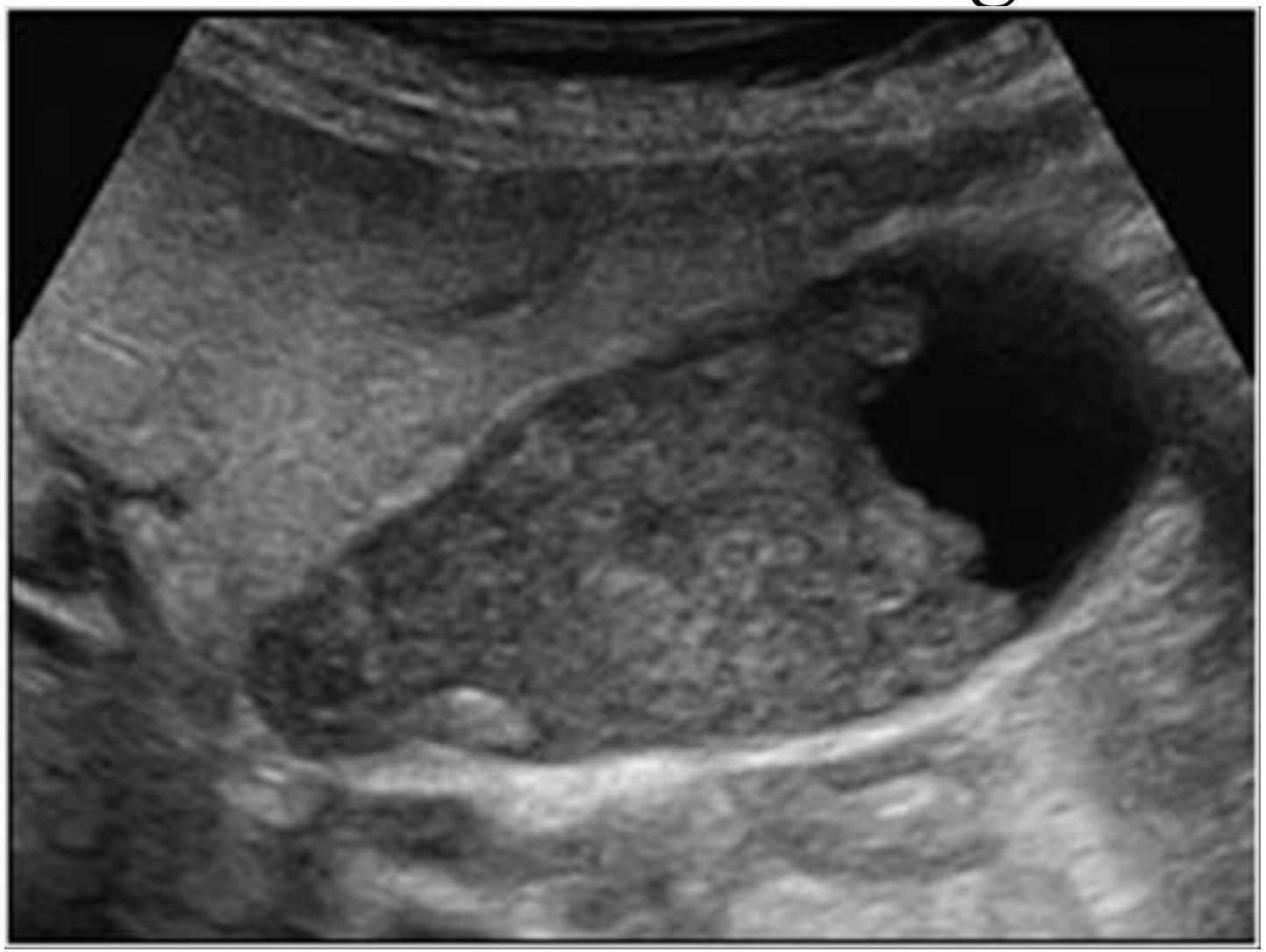
Cholelithiasis: “shadowing”

Gallbladder Sludge

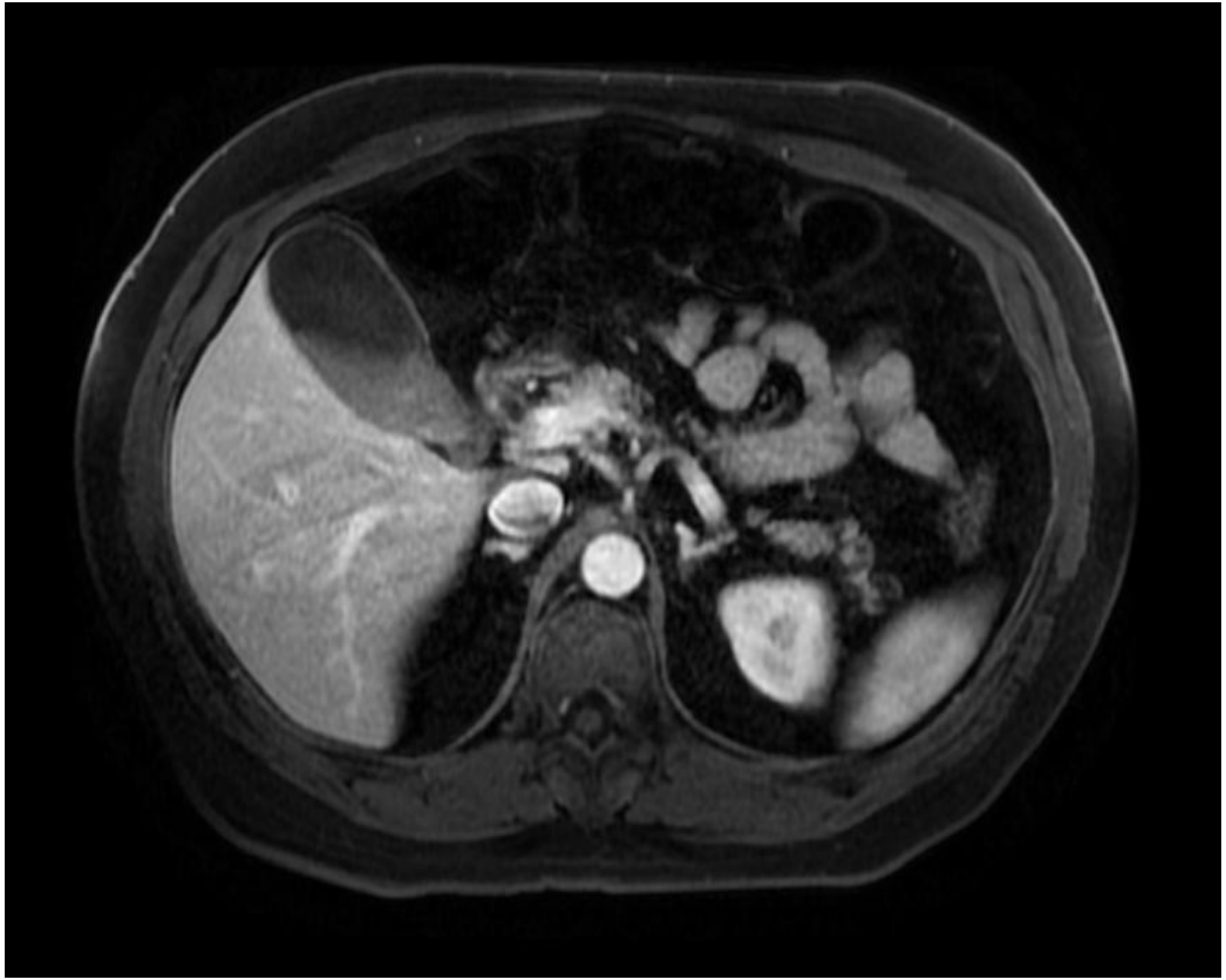
Gallbladder Sludge



Gallbladder Sludge



Gallbladder Sludge



Computed Tomography

Advantages:

1. Assess surrounding structures
2. Rough estimate of CBD size
3. Assess pancreas
4. Assess fluid collections
5. Repeatable/Comparable
6. Used to guide/assess drain placement
7. Best to guide/assess stent placement

Computed Tomography

Disadvantages:

1. Not portable
2. Not the best estimate of CBD size
3. Not best indicator of GB wall thickness
4. Radiation exposure

MRCP (Magnetic Resonance Cholangio-Pancreatography)

Advantages:

1. BEST for evaluation of CBD (assess for intrinsic/extrinsic defects)
2. BEST for determining CBD size
3. GOOD indicator for GB thickness
4. Good for surrounding masses/anatomy

MRCP

Disadvantages:

1. Not portable
2. Not poss in pts with non-compatible implants
3. Not always readily avail
4. Not avail at every institution
5. Interpreter dependent
6. COST !!!!!

ERCP Procedures:

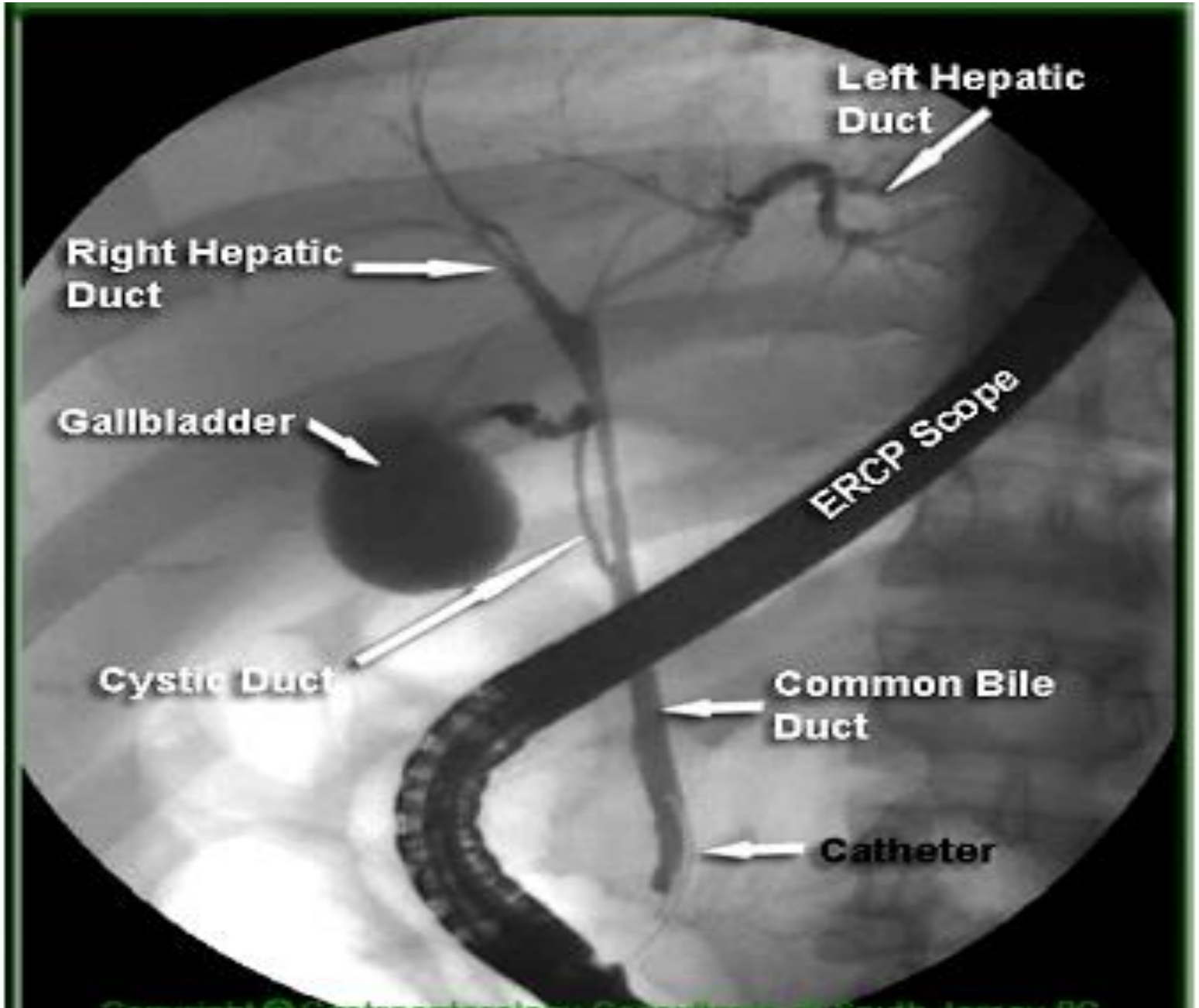
- Dye injection for diagnosis
- Sphincterotomy
- Stent placement (covered vs noncovered
- Biopsy (beware of “atypia”)
- Dilatation of strictures
- Possibilities only limited by technology/skill

ERCP (Endoscopic Retrograde Cholangio-Pancreatography)

Disadvantages:

1. Invasiveness: Moderate to great
2. Requires general anesthesia (30-120 min)
3. Typically done prone
4. Bleeding/Perforation
5. Post-ERCP pancreatitis (inc lipase PLUS sx)

ERCP


Left Hepatic Duct
Right Hepatic Duct
Gallbladder
ERCP Scope
Cystic Duct
Common Bile Duct
Catheter

ERCP with CBD and PD stones

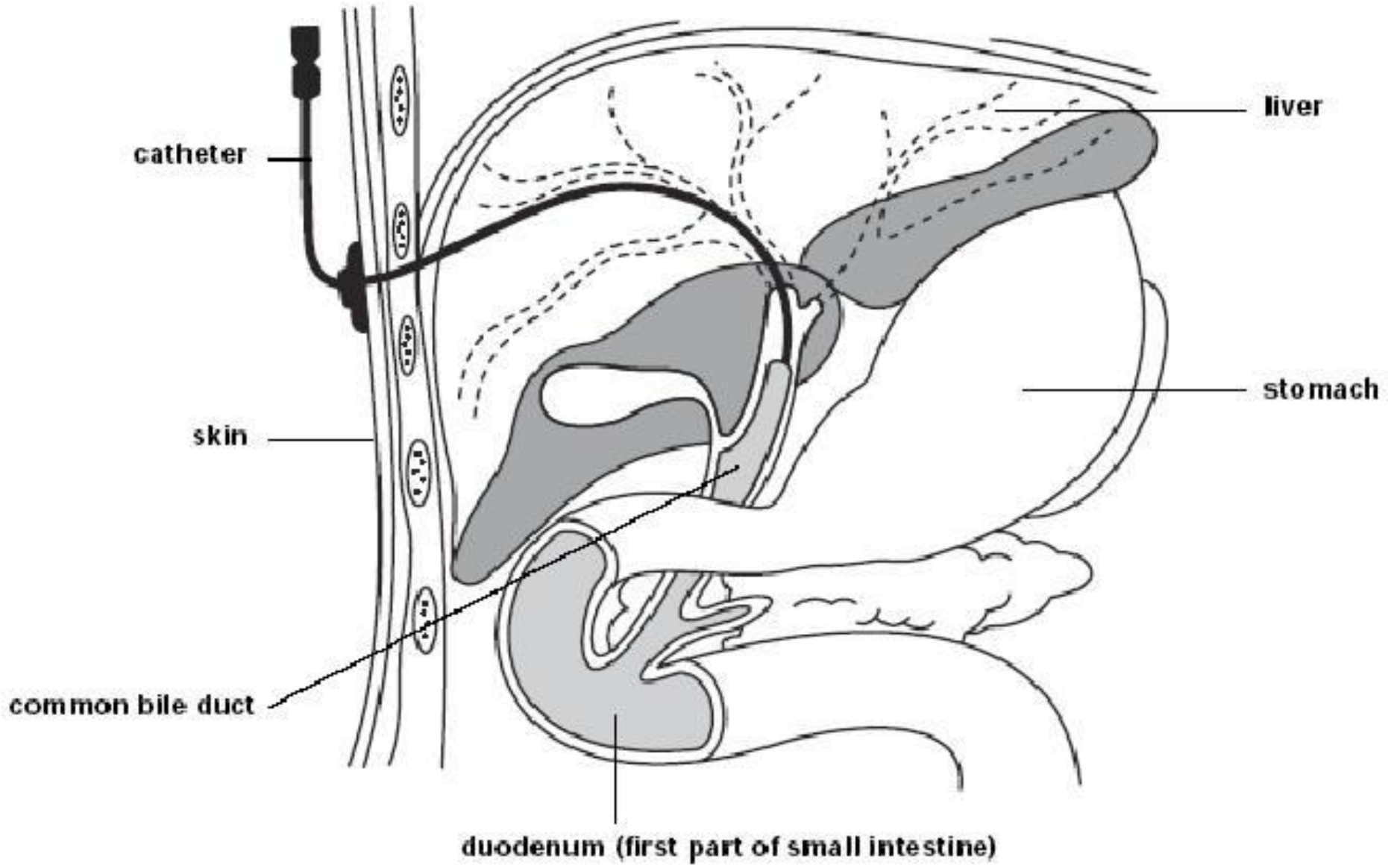
Endoluminal Stent

Endobiliary Stent

PTC (Percutaneous Transhepatic Cholangiography)

- Currently rarely done
- HIGH complication rate
- Diagnostic and therapeutic (similar to ERCP)
- Main indication: CBD obstruction when ERCP unsuccessful
- Rendevous Procedure: combined ERCP and PTC

PTC


liver
catheter
stomach
skin
common bile duct
duodenum (first part of small intestine)

PTC with Choledocolithiasis

IOC (Intra-operative Cholangiography)

- Most surgeons do “selective” cholangiograms
- Need for anatomy
- Need to exclude CBD stone in pts with bumped LFT’s
- Pts with big CBD pre-op

IOC (Intra-operative Cholangiography)

- Most commonly done at time of cholecystectomy to "clear" CBD (i.e. after GB-pancreatitis)
- Minimally invasive
- Occasionally done to delineate anatomy
- Use can by routine or selective
- Has not been shown to reduce ductal injuries

IOC

EUS (Endoscopic Ultrasound

Ultrasound

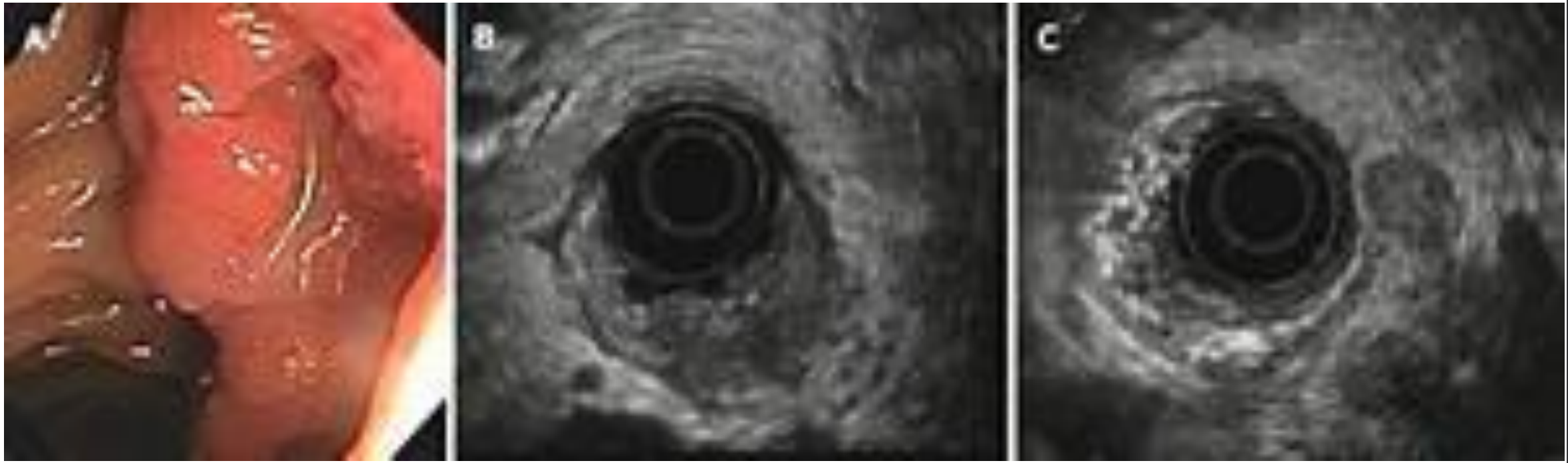
1. Therapeutic
2. Anatomy dependent
3. No radiation exposure w US
4. Very sensitive (closeup view)
5. High tech equipment
6. Expertise

ERCP

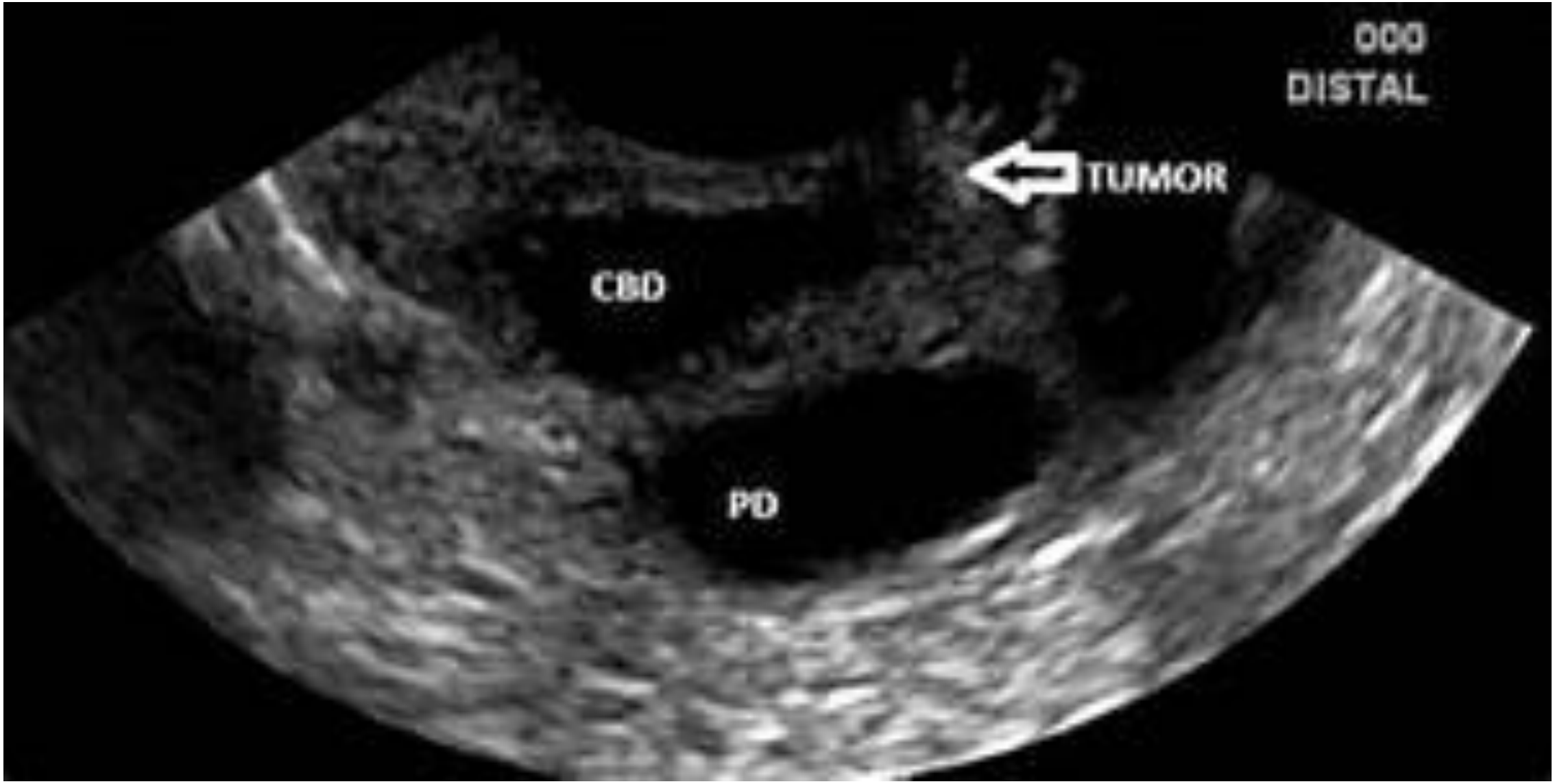
1. Therapeutic (i.e. biopsy)
2. Bleeding
3. Perforation
4. Some fleuro usually required

EUS Scope

EUS



EUS



HIDA (Hepatobiliary Imino-diacetic Acid)

- radiolabeled isotope injected IV
- taken up by hepatocytes from the bloodstream
- Excreted into bile canaliculi
- Traverses extrahepatic biliary tree
- Empties into duodenum via common duct

HIDA (Hepatobiliary Imino-diacetic Acid)

- Three phases (each described in interpretation)
    1. Hepatic phase: requires adequate hepatic uptake sufficient dye
2. Extra-hepatic phase: Ductal, GB, extravasation
3. Intestinal: visualization seen in GI tract
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HIDA (Hepatobiliary Imino-diacetic Acid)

Indications:

1. VERY limited value in ED/inpt setting:
   -GBUS is WAY better for cholecystitis
   - high false (+) rate in NPO pts.
   - Does not detect pericholecystic fluid
   - Non-viz does NOT indicate cholecystitis !!!!!!!!!!

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HIDA (Hepatobiliary Imino-diacetic Acid)

HIDA reports equate Non-viz of the GB as EQUAL to acute cholecystitis.

BUT… in pts that are NPO, the Gb is already full of bile and no tracer can ge in… giving a non-viz result. In this case it does NOT = cholecystitis !!!!!!

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HIDA (Hepatobiliary Imino-diacetic Acid)

This includes ICU pts as well as ED pts.

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HIDA (Hepatobiliary Imino-diacetic Acid)

Best uses for Inpatients:

- detect post-op bile leaks
- confirm patency of CBD stent

Best uses for patients:

- NONE (always order “with CCK”)

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HIDA (Hepatobiliary Imino-diacetic Acid)

Reminder:

Patients who have had a cholecystectomy… also have a “non-viz” HIDA !!!!!!!!!!

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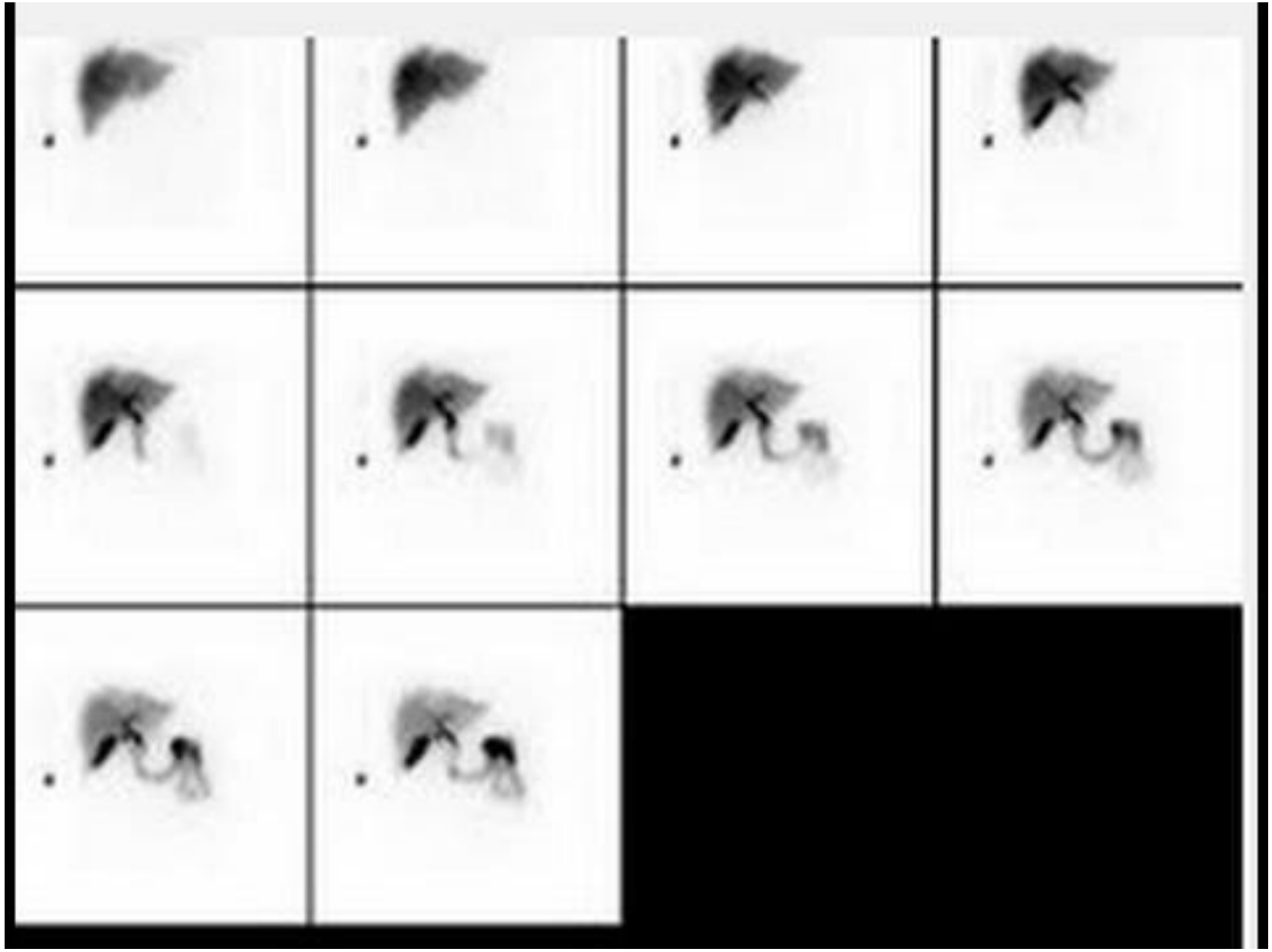
HIDA



HIDA with CCK

Different test than “simple” HIDA:

Initial portion of HIDA scan is performed, then a pharmacological dose of CCK is given IV. This causes GB contraction. Tracer counts are measured pre- and post-injection. The percent defference is the GBEF (gallbladder ejection fraction)

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HIDA with CCK

GBEF (gallbladder ejection fraction) is normally > 70%.

Abnormal is calculated to be 35% or less.

In a patient with biliary colic symptoms, this low GBEF makes the diagnosis of biliary dyskinesia.

HIDA with CCK

IF the GB is not visualized initially, then GBEF is not poss and CCK is not administered.

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Patient Management

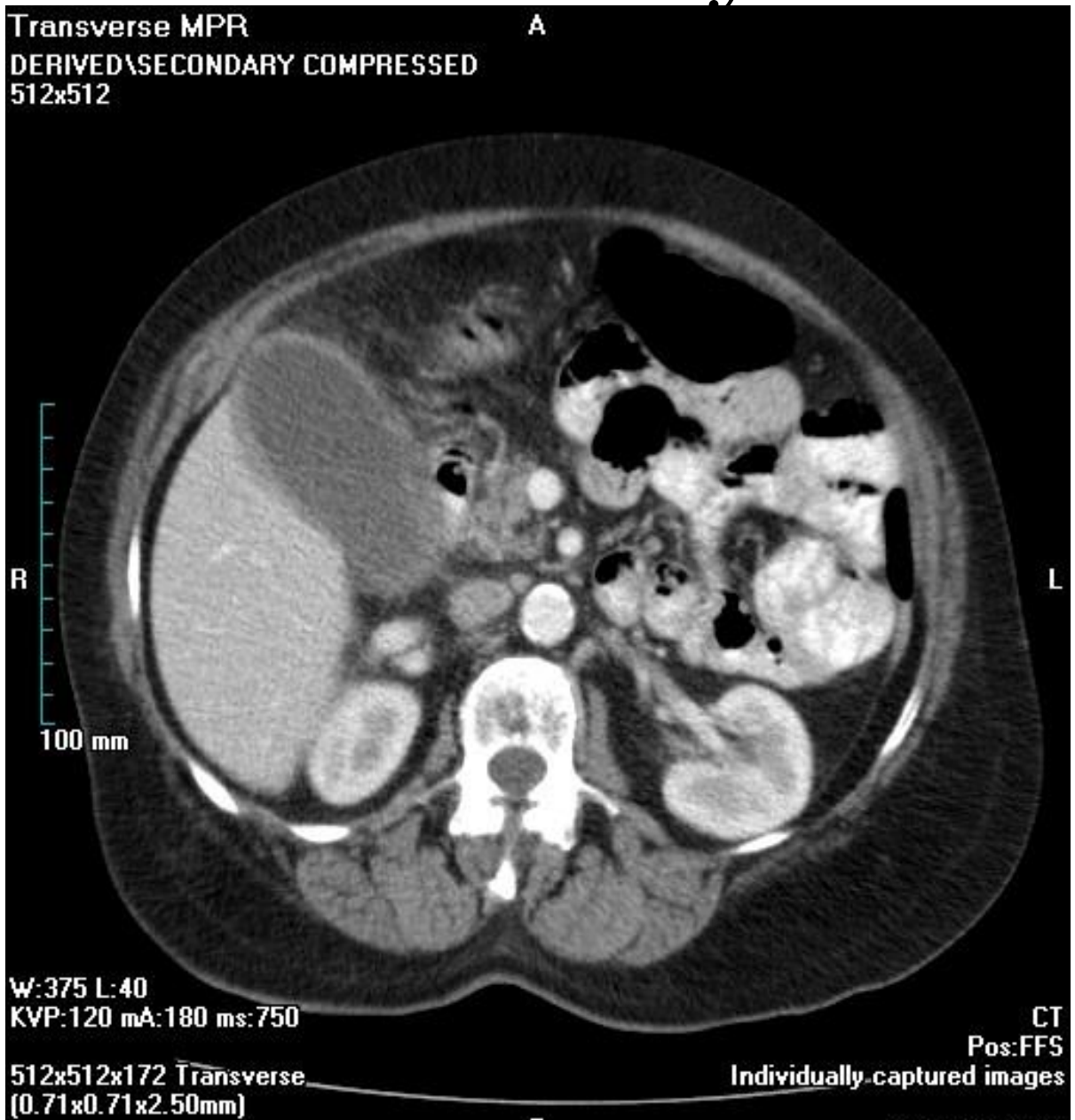
Acute Cholecystitis:

1. Syptoms of biliary colic
2. Cholelithiasis

Cholecystectomy is > 95% effective

Acute Cholecystitis

Acute Cholecystitis



Patient Management

Bilary colic: (ie outpt setting):

1. Syptoms of biliary colic
2. GBUS is normal → do HIDA-CCK

If GBEF low then:

Cholecystectomy is > 90% effective

Patient Management

Bilary colic: (ie outpt setting):

1. Syptoms of biliary colic
2. GBUS is normal
3. HIDA-CCK is normal

then what… ?

Patient Management

We rarely perform cholecystectomy based on symptoms alone (normal testing), because success is 50/50.

These pts need GI eval and usually EGD to exclude other dx's.

Patient Management

IF… Pt's sx are classic and other dx's have beed excluded, we on RARE occasion proceed with GB removal.

Patient Management

Patient has stones, no symptoms (asymptomatic cholelithiasis)…

No surgery (few rare exceptions)

Patient Management

Acute Cholecystitis:oooooooooooooo

Patient Management

Patient has no symptoms, but low GBEF…

No surgery (GBEF is calculated cutoff, and 6-8% normally have lowGB EF

Patient Management

Acute Pancreatitis:

- ERCP is very risky in face of active pancreatitis
- MRCP is CLEARLY best to exclude a CBD stone
- MRCP has made “diagnostic” ERCP obsolete.

Acute Gallstone Pancreatitis (cont):

- If pt's clinical picture and labs are rapidly improving, the stone has likely passed and we will likely clear the CBD w IOC at time of surg.

- GB surg should be done at end of same hospital stay

Acute Gallstone Pancreatitis (cont):

- If pt's IOC is (+), then proceed with ERCP day after surgery

Acute Gallstone Pancreatitis (cont):

- If pt's IOC is (+), historically we proceeded with CBD exploration and T-tube placement.

- This is soooooo invasive, and has so many complications, AND ERCP is not, operative common duct explorations are rarly done (ca, injury, etc)

Thank you !

Questions ??

Boooooooooooo

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HIDA (Hepatobiliary Imino-diacetic Acid)

- radiolabeled isotope injected IV
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Right

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