Examination Review

Junior Radiology

2012
Ultrasound Applications: OB/GYN, Abdominal, Vascular?
ULTRASOUND of Deep Venous Thrombosis
RUQ PAIN

Gallstones

US:
Cholelithiasis
Ultrasound

• ULTRASOUND does not have the radiation exposure that CT and general XRAYS have.

• Although ULTRASOUND at medical levels is considered safe, future discoveries are of course not known, and it is generally recommended that ultrasound be only used when medically necessary.
Ultrasound

- Exploits differences in acoustic properties of adjacent organs to produce images

Ultrasound and MRI are Non-Ionizing
This is a Breast Malignancy at Ultrasound: True or False?

(Additional mammographic views were followed by ultrasound).
Screening mammogram includes 4 views?
Screening begins at age 40?
True vs. False

- True: Malignant Mass, Ultrasound
- True: CC and MLO views Bilaterally
- True: Screen starts at age 40
BI-RADS is an assessment scale indicating the likelihood of breast cancer for mammographic findings.

TRUE OR FALSE ?
TRUE: BIRADS

• 0 Further information needed to put in assessment category
• 1 Normal
• 2 Benign finding
• 3 Probably benign-6 mo followup
• 4 Suspicious-biopsy
• 5 Malignant-biopsy
Short of breath
Central line just placed
A. Pneumothorax
B. **Expiratory CXR** may accentuate the finding.
C. **CT** is an effective modality in identifying this abnormality in patients too ill to undergo upright PA radiograph.
D. All of the above
Hounsfield units (HU)

A. Gas: -1000
B. Water: 0
C. Bone: +1000

1. bright.amr.harvard.edu/.../hem/he333/full.html
CT Knee:
appearance of fat/fluid suggests Lipohemarthrosis
RLQ pain in a 20-year-old male

A. Small bowel obstruction
B. Ileus
C. Normal
D. Appendicitis
Right Lower quadrant pain in 20 year old male

A. Small bowel obstruction
B. Ileus
C. Normal
D. Appendicitis
A. Ischemic Infarct on the Left
B. MRI
C. CT
D. Epidural Hematoma
E. C & D
Epidural Hematoma

E. CT, Epidural Hematoma

ALSO:
Middle Meningeal Artery
Associated with Fracture
DOES NOT Cross Sutures
CXR
Enlarged Silhouette
- Pericardial EFFUSION
- CARDIAC Chamber enlargement
- CARDIO-MYOPATHY
- CARDIOGENIC Pulmonary Edema
- ANY or ALL
Diagnosis from which two modalities? (one not shown)
Contrast CT or Pulmonary Angiogram to Diagnose
V/Q Nuc Med LUNG SCAN

Is Ionizing Radiation
TcMAA is used for Perfusion

Probability (not diagnoses)
of Pulmonary Embolus
Angioplasty

TRUE or FALSE:

• 1. Done Under Fluoroscopic Guidance?

• 2. Done to Relieve Narrowing in a vessel (most frequently) or other tubular anatomic structure?

• 3. Sometimes need buttressing with a Stent?
True or False?

• 1. TRUE
• 2. TRUE
• 3. TRUE
Most likely

A. Pulmonary Edema (fluid) in the interlobular septae
B. Normal
C. Kerley B lines
D. A and C
Kerley B lines
CXR

A. Fluid in septae
B. 
C. Kerley B lines left Costophrenic angle
D. A and C. A is the definition of Kerley lines
Modality, ionizing , normal?
Nuclear Medicine, Yes, Bone Mets
Pelvic XRAY
Bone Metastases
IONIZING RADIATION?
History of weight loss.

Diagnosis:

A. Mets or Multiple myeloma
B. Normal
C. Rickets
D. Post traumatic changes
- PNEUMOPERITONEUM
- NORMAL
- PNEUMONIA
ABDOMINAL EMERGENCIES

- Pneumoperitoneum
- Appendicitis (CT preferred)
- Diverticulitis
- Ischemic Colitis can get pneumotosis coli/ PV intrahep air
- Hemorrhage = Leaking aneurysm, laceration spleen/liver/renal
DIAGNOSIS:

PNEUMO-PERITONEUM
What is the SIGN?

History: FEVER
What is the SIGN and what does it mean?

- **SPINE SIGN =**
- **AIRSPACE DISEASE:** Pulmonary Edema or Pneumonia

Diagnosis: **PNEUMONIA**
History: Fever Diagnosis?

A. Pneumothorax
B. Normal
C. CHF
D. Pneumonia

SIGN?
Pneumonia

• SILHOUETTE SIGN LEFT HEART BORDER
Lingular Pneumonia

NL?
Cerebral Edema

• CYTOTOXIC = stroke (CVA), wedge-shaped/vascular territory

• VASOGENIC CEREBRAL EDEMA: Tumor, infection.
  –Metastatic from tumor may account for Multiple ring enhancing lesions
CNS Lymphoma (Unenhanced CT)

What type cerebral edema?
Brain Mets(CECT)
Type of edema?

Modality.

Diagnosis

- FLAIR
- DIFFUSION
Cytotoxic Cerebral Edema, MRI diffusion weighted sequence, CVA/stroke

- Cytotoxic = stroke (CVA), wedge-shaped/vascular territory
Interventional Procedure of benefit? Disease?
CONTRAST Abdominal CT

HYPERvascular liver metastases
Chemoembolization by Interventional
Interventional Procedure: Chemoembolization
Common Indications for IV Contrast in CT

- To visualize blood vessels (Aortic injury, Abdominal Aortic Aneurysm, Pulmonary Embolus)
- To evaluate for primary or metastatic tumor
- To evaluate for infection or inflammatory processes
- To evaluate for traumatic injury
INFECTION or CANCER Possible?
YES!
TB Cavity w Fungus Ball
CT
History:
chronic FEVER and heart murmur

A. NORMAL

B. SEPTIC EMBOLI-endocarditis

C. PNEUMO-THORAX
Multiple Pulmonary Nodules
LUNG

Neoplastic : Metastases, Kaposi’s, Primary Lung Cancer
Infection
Septic Emboli
CT Lung windows
Air -1000 HU
1 Normal

- Trachea
- Aorta
- Interlobar artery
- Right interlobar artery
- Confluent SHADOW of Right interlobar artery and superior vein
- Lt interlobar artery
- Spine
  - Note: Density is darker inferiorly
- Rt Diaphragm
Malignant Neoplasm

- Metastatic = Multiple vs. Primary
- **CT or MRI** shows Contrast Enhancement (Administered Intravenously)
- Look at other organs
- Spread is Hematogenous (to bone, liver), Lymphangitic (Kerley/lung), Direct invasion (erode bone)
NG tube punctured Stomach & Diaphragm
Small bowel obstruction (KUB, CT)

More examples of SBO
This patient

A. May develop atelectasis of the right lung
B. Should not be fed through this tube
C. Demonstrates the silhouette sign in the left lung base
D. All of the above.
NG tube in bronchus
Silhouette sign LLL
Nausea/Vomiting

History of Surgery years ago

Diagnosis

A. Normal gas pattern

B. Small bowel obstruction

C. Ileus
PNEUMOPERITONEMOUS

Can’t Miss (AUR) = ABDOMINAL EMERGENCY

- Air outside of viscus
- Air = Lucent (HU = -1000)
- Paucity of Air
- Dilated Bowel
- Peritonitis 6hrs.
80 year-old female with a recent fall

27. The Bones can be described as:
   A. Normal
   B. Sclerotic
   C. Osteopenic
80 year-old female with a recent fall

28. The main radiographic finding(s):
   A. Fracture
   B. Fracture & Anterior shoulder dislocation
   C. Sclerotic metastasis
29. White & Yellow arrows demonstrate:
A. Elbow joint effusion & radial neck fracture
B. Subluxation of the elbow joint
C. Triceps tendon rupture & radial head fracture
The finding in the image (arrow) demonstrates what?

A. Intra-articular body  
B. Joint effusion with fluid-fluid level  
C. Bone tumor  
D. Osteomyelitis
45yo male with traumatic knee injury. MRI Knee with multiple abnormal findings.

The arrow is pointing to what particular finding:

A. Bone marrow contusion  
B. Infection  
C. Tumor  
D. Osteoarthritis
67 yo male with new onset ataxia, abnormal gait & difficulty walking

36. Diagnosis?
A. Achilles tendon tear
B. Rotator cuff tear
C. None of the above – this is an MRI of the brain showing an acute cerebral infarction in the cerebellum.

HINT: #1 Principle of MSK ANATOMY

What structure normally lives there & is not identified?
Normal

Trachea

Aorta

Spine

Note:
Density is darker inferiorly
"SPINE SIGN"

DIAGNOSIS?

- Pneumonia
Hx: FEVER

Lingula pneumonia
Visceral Pleural Line
Mediastinal Shift
Hx: STAB WOUND
-Tension PTX
?Treatment
TENSION PNEUMOTHORAX
Multiple air fluid levels

'String of pearls' sign indicating mechanical obstruction
Free air under right hemidiaphragm
SBO

upright

R
Rigler’s Sign: free air
Rigler’s Sign: free air
Acute Cholecystitis

Positive Sonographic Murphy’s Sign

Acute Cholecystitis
TRAUMA - NEURORADIOLOGY

• SUBDURAL HEMATOMA
• SUBARACHNOID HEMORRHAGE
• CONTUSION
Normal head CT
Hx: trauma
Subdural Hematoma
Hx: trauma

Subdural Hematoma
EPIDURAL HEMATOMA

Does not cross suture lines
EPIDURAL HEMATOMA
NEURORADIOLOGY

- SUBARACHNOID HEMORRHAGE
Traumatic SAH
SAH secondary to MCA aneurysm
Epidural hematoma

contusion
Normal feeding tube position:

- The tube follows a straight course down the midline of the chest to a point below the diaphragm.
- The tube does not follow the path of a bronchus.
- Tube is not coiled anywhere in the chest.
- The tip of the tube is below the diaphragm.
Feeding tube in right mainstem bronchus
Right mainstem intubation

Feeding tube in left mainstem bronchus