NOVEL AND STANDARD IMAGING TECHNIQUES: 
RADIOGRAPHS, CT, & PET
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Disclosure

• No relevant financial disclosures
Introduction

Radiology imaging studies form a pivotal role in diagnosis, staging, monitoring treatment, detect anatomic complications
Oncologic complications

• Direct/Structural
  – Invasion or compression or adjacent structures

• Indirect-
  – Immunocompromised status
  – Hypercoagulability
  – Paraneoplastic syndromes
Imaging Modalities

- Plain radiography: X-ray
- CT: X-ray
- Ultrasound: Sound waves
- MR: Magnetic field
- PET-CT: Radioisotope
Standard Vs Portable Radiography

http://www.chd-uk.co.uk/types-of-chd-and-operations/non-invasive-tests/
Standard Vs Portable Radiography

http://www.flickr.com/photos/beckerbuns/2320521490/in/photostream/lightbox
Standard Vs Portable Radiography
Opacity versus lucency
69-year-man, chronic smoker, presented with cough and fever
65-year-old man, smoker for 25 years, chronic dry cough since 4 months.
Chest - Dual energy
Non-contrast versus Contrast
Contrast media

- Intravenous
- Oral
Role of Oral contrast study

- Luminal details of the bowel
- Obstruction
- Perforation
Role of IV contrast study

- Heart and Blood vessels
- Solid organs
- Lymph nodes
- Tumor characteristic- solid versus necrotic
- Tumor invasion
- Fluid collection versus abscess
Contraindications for intravenous contrast

• Renal failure:
  – Serum creatinine
  – eGFR <30

• Contrast reaction:
  – Mild: hives, rash, itching
    • Premeditation- steroid, antihistaminic
  – Severe: Anaphylaxis, angioedema, stridor
Contrast Induced Nephropathy

Increase in Serum creatinine (SCr)

• 25% relative increase, or
• 0.5 mg/dL (44 µmol/L) absolute increase,
• within 72 h of contrast exposure,
• in the absence of an alternative explanation
MR

• Better soft tissue characterization
• Longer study
• No radiation
Risk of NSF among patients exposed to standard or lower than standard doses of *group II* GBCAs is sufficiently low or possibly nonexistent such that assessment of renal function with a questionnaire or laboratory testing is optional prior to intravenous administration.
H/O Breast cancer, now presented with altered mental status
Lung Ca
Oncologic Emergencies

• Abdomen:
  – Intestinal obstruction
  – Hemorrhage
  – Urinary tract obstruction

• Chest:
  – Pleural effusion
  – Pericardial effusion
  – SVC syndrome

• CNS:
  – Spinal cord compression
  – Herniation
52-year man undergoing chemotherapy for lymphoma. Presents with lethargy and fever.
Pneumothorax
Cavitation
Pericardial effusion
70-year-man with weight loss and increasing swelling over neck and upper extremities
Post Radiation Fibrosis
61-year man with stage 1 lung cancer

3 months s/p SBRT
Esophageal Cancer - Perforation
Iatrogenic - Lines/Ports Malposition
Iatrogenic- Lines/Ports malposition
Iatrogenic - Lines/Ports

Thrombus

Case 1

Case 2
Abdomen AP radiograph
Intestinal obstruction
Distal small bowel obstruction
Hemorrhage
Urinary tract obstruction
Urinary tract obstruction
Lower Extremity Doppler

Normal Left femoral vein
Lower Extremity Doppler

Acute DVT Right femoral vein
Spinal cord compression
Cerebral herniation
64-year-man with h/o left nephrectomy for renal cell carcinoma
Summary

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Thank you

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