BONE METASTASIS

Bone Mets

- Bone is 3rd most common metastatic site
- >75% of bone mets are from breast, prostate, or lung
- Lung is 3rd most common origin
- If primary unknown, most likely are lung or kidney
- First manifestation of cancer in 12 to 20%
- Pain is the most common presenting sx
- Lung = Lytic more common than blastic
  (Lung and Breast can be Lytic or Blastic)

Bone Mets

- Thyroid: 4-13% bone met incidence
- Renal cell: 25-50% bone met incidence
- Both usually lytic, but renal can be more expansile and destructive
- Both high risk for pathologic fx

Most common bone sites = Spine, Femur, Humerus, Ribs, Pelvis, Cranium, Sternum
- "FISH" Bones (femur, ilium, spine, humer)
- 50% of hand bone mets are due to lung CA
- AXIAL = always "Axial eXcept In A Lung"
- "Lung lesions go Long"
- Lung neoplastic cells gain arterial access
- Usual venous pathways go to liver and lung

Spine Mets

- Vertebral column is most common site
- Incidence greatest in L>T>C spine
- T-spine accounts for most symptomatic cases
  (70% thoracic – predilection for T4 and T12)
- Bonescans are sensitive but not specific
- X-rays are good initial screen
- CT or MRI for suspicious sx’s if x-rays normal

Prognosis

- Avg 6 months after bone met in lung CA
  (Avg 29 months after bone met in prostate CA)
- Stage IIIIB NSCLC has 37% 1 yr and 7% 5 yr survival
- 25% of all long bone mets fracture, but proximal femur has 40-60% incidence
- Lytic more likely to fx than blastic
Treatment Options
- XRT
- Surgery
- Bisphosphonates
- Opioids
- Calcitonin/Vitamin D/Calcium
- Steroids for inflammation/pain
- Chemotherapy directed at primary cancer
- Limit weight-bearing, assistive devices
- Spinal orthoses

Radiation Therapy
- XRT: depends on cancer type
- 35% stay ambulatory if walking pre-XRT
- 60% improve if limited walking pre-XRT
- <40% recover bowel function if lost before XRT
- Irradiation might increase risk of fx
- Temporary softening and less reossification
- XRT+surgery vs XRT: controversial
- Peri-op mortality 8%. Peri-op infxn rate 4%

Surgical indications
- Intractable pain
- Impending pathologic fracture
- Established fracture
- Life expectancy >6 weeks (controversial)

Pathologic fracture risk factors
- Femur:
  >1.3 cm femoral neck cortical destruction
  >2.5 cm elsewhere in femur
  >50% total diameter involvement
  >30-50% cortex involvement

  Spine:
  Denis (Spine 1983) 3 column spine model:
  Unstable if 2 or more columns involved
  or if the middle column is severely distorted

Surgical criteria
- Mirel's criteria for long bones:
  1) Pain: mild, moderate, severe
  2) Location: UE, LE, intertrochanteric
  3) Size: <1/3 cortex, 1/3-2/3, >2/3 cortex
  4) Type: blastic, mixed, lytic
  Assign 1-3 points for each category.
  >9 points = surgery
Spine surgery approach

- For diffuse disease, posterior approach used for decompression and stabilization via fixation of 2 levels above and 2 levels below
- For 1-2 levels, anterior approach better
- Vertebroplasty for 1-2 level vertebrae can be considered but can be risky with brittle bone
- Treatment plan must always involve intense counseling with patient, family, and team