Spinal Tumors
and
Tumor-like conditions
Spinal cord lesions

• Lesions usually designated by their relationship to the cord
  
  – **Extradural**
  
  – **Intradural extramedullary**
  
  – **Intramedullary**
    
    • Short segment – Less than 2 vertebral segments
    • Long segment – More than 2 vertebral segments
Spinal cord lesions

• Contrast used for:
  – Cystic vs Solid lesion
  – Tumor – intradural/extradural lesion
  – Infection – differentiation of ST edema from abscess
  – Differentiation of Post-op fibrosis vs recurrent disk lesion
Gadolinium
Spinal cord lesions

• Extradural lesions include:

  – Lesion extending from spine include

  • Disk lesions
  • Lymphomas, sarcomas
  • Multiple myeloma
  • Metastatic lesions
45 y.o. female

Right-sided neck pain and marked decrease motion
Radicular symptoms on right C5/C6
No significant history of trauma or malignancy
Extradural lesions
Extradural lesion

Non-Hodgkins Lymphoma
Extradural lesions
Extradural lesions
Arachnoid cysts throughout spine

Case courtesy of Dr Aruna Pallewatte, Radiopaedia.org, rID: 27648
Spinal cord lesions

- Intradural extramedullary lesion include:
  - Meningiomas
  - Neurogenic tumors (i.e. neurofibroma/neurilemoma)
  - Lipomas
  - Intradural cysts
  - Intradural METS
Intradural extramedullary lesion

Fibrolipoma within filum terminale

Case courtesy of Dr Frank Gaillard, Radiopaedia.org, rID: 8899
Intradural extramedullary
Erosion of pedicle enlarged IVF
Neurofibromatosis
Spinal cord lesions

• Intramedullary lesions include:
  – Ependymoma — Myxopapillary ependymoma in filum terminale
  – Astrocytoma
  – Hemangioblastoma
  – Metastatic disease
  – Multiple sclerosis
Intramedullary lesion

Ependymoma

Case courtesy of Dr Ahmed Abd Rabou, Radiopaedia.org, rID: 31233
Intramedullary lesion

Metastatic disease from lung CA

T1 w/contrast
Intramedullary lesion
Multiple Sclerosis involving cord

T2WI  T2 Fat Saturated  T1 contrast

Case courtesy of Dr Maxime St-Amant, Radiopaedia.org, rID: 19272
Multiple Sclerosis

Case courtesy of Dr Hani Salam, Radiopaedia.org, rID: 8662
McDonald diagnostic criteria

**Dissemination in space**
- Greater than 1 T2 bright lesion in 2 or more of the following locations:
  - Periventricular
  - Juxta cortical
  - Infratentorial
  - Spinal cord

**Dissemination in time**
- Presence of a new bright lesion on T2 or contrast-enhanced (compared to previous scan)
- Presence of asymptomatic enhancing and nonenhancing T2 lesions on one scan

Dr Bruno Di Muzio and A.Prof Frank Gaillard et al. Radiopedia
Tumors of the spine

Benign and Malignant osseous lesions
Spinal lesions

- Osseous lesions within the spine can include:
  
  - Benign tumors
    
    - Hemangiomas
    - Osteoid osteoma/Osteoblastoma
  
  - Malignancies
    
    - Metastasis
    - Myeloma
    - Lymphoma
Hemangioma
Spinal lesion
Hemangioma
Hemangioma
38 y.o. male

Pain in back of neck (cervicothoracic junction) after minor fender-bender. State that region has been “sore” for months but post-accident is painful.
Aneurysmal Bone Cyst
Aneurysmal bone cyst

- Usually patient under the age of 30
- Almost always expansive and usually painful
  - Advanced imaging shows multiple fluid levels within the lesion
  - Secondary ABC can occur in conjunction with another lesion or trauma
Spinal lesion - Benign
Special thanks to Richard Arkless, M.D. for this case
Osteoblastoma

• 2 different radiographic presentations

  – In long bone can present as large osteoid osteoma
    • Central lucency surrounding sclerosis

  – In spine expansile lesion usually in posterior elements
    • Can simulate Aneurysmal bone cysts in spine
      – Should be considered when ABC is considered
ABC vs Osteoblastoma
56 y.o. Male

- Neck pain of long duration
  - Dull ache seems to be getting worse over time
- No history of significant trauma
- No history of primary lesions
Paget’s disease
Scintigraphy – Bone scan

Post Spine

R. Lat
Paget’s disease
Fibrous dysplasia
Fibrous dysplasia

• Congenital benign process
  – Seen in any age
  – Radiographically looks like anything

  • Usually presents:
    – No periosteal response
    – Not symptomatic (unless fractured, which is often in long bone).
    – M/C monostotic but can be polyostotic (pelvis/femur).
    – Café au lait spots
Malignancies
Multiple Myeloma

• Patterns in order of increasing frequency:

  – Normal appearance (low tumor population)

  – Focal lesion(s) - *Plasmacytoma*

  – Variegated (heterogeneous)

  – Diffuse (homogeneous)
Multiple Myeloma

Variegated or heterogeneous pattern
Multiple Myeloma
Multiple myeloma
Low back pain
Plasmacytoma

Case courtesy of Dr Henry Knipe, Radiopaedia.org, rID: 42879
Metastatic disease

• Spread via Batson Venous plexus to axial skeleton
  
  – Rare to have METS below elbow or knees
  
  – M/C 1°: Breast, Lung, Colon
Metastasis from lung primary
Blastic Metastasis - Prostate
Blastic METS: Prostate
Metastatic disease
Metastatic Disease
Metastatic Disease
Magnetic resonance imaging

Patient 4
Osteoporotic vs. Pathologic Compression fractures

- **Osteoporotic**
  - Abnorm. signal limited to vertebral body
  - Usually no S.T. mass
  - Fatty marrow persists in body
  - Usually solitary
  - Concave posterior wall

- **Pathologic**
  - Abnorm signal in pedicles/post. elements
  - Soft tissue mass assoc.
  - Entire vert. body involved
    - Post body margins important
  - Convex post. Body wall
  - No fracture line
Osteoporotic vs Pathologic Compression fracture

Benign compression fracture
Radiology Round MGH; JC Miller et al.
Vol. 7, Issue 7, 2009

Metastatic disease
Thanks to Richard Arkless, M.D.
Traumatic or Pathologic?
Thank You for your Attention