Interesting Spine Cases

Organ Imaging 2012
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Case 1 Differential

- Tumour
  - Metastases
  - Lymphoma
  - Ependymoma
  - Hemangioblastoma

Spinal Hemangioblastomas

- Rare (1.6-5.8% of all spinal tumours)
- Either sporadic or part of VHL
  - 32% of patients with spinal HMB have VHL
  - Rest are sporadic
  - Multiple usually VHL
Spinal Hemangioblastomas

- Mean age 30 years onset
- MRI
  - Relative to cord: Iso-to-hypo T1, iso-to-hyper T2
  - Intense enhancement
  - +/- Cyst / syrinx
  - +/- flow voids
  - Rare to hemorrhage
- Most in thoracic region, then cervical
- May originate from any compartment of spinal canal and vertebral body

Spinal Hemangioblastomas

- Appearances
  - Exophytic (66%)
  - With Syrinx (40-55%)
  - Cord enlargement (23%)
  - Extramedullary (8%)

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Spinal Hemangioblastomas

- Appearances
  - Exophytic (66%)
  - With Syrinx
  - Cord enlargement (23%)
  - Unique characteristics of spinal HMB
  - Enlargement beyond margins of nodule and distinct from syrinx
  - Due to AV shunting, venous congestion, edema

Spinal Hemangioblastomas

- Appearances
  - Exophytic (66%)
  - With Syrinx (40-55%)
  - Cord enlargement (23%)
  - Extramedullary (8%)

Case 2

- 54 yo male
- Abrupt onset paraplegia following MV surgery

1 week after onset

Case 2 Differential

- Transverse Myelitis
- Demyelination
- Cord Infarct
- Tumour
- Infection
- Inflammatory
- Vascular – AVM / AVF

Spinal Cord Infarct

- Clinical: Sudden onset (hours)
- MRI
  - High T2, slight cord expansion, anterior cord
  - Diffusion restriction
  - Enhancement in subacute phase
Spinal Cord Infarct

- **DDx**
  - Transverse Myelitis
    - Onset not as acute
    - Central; >2/3 area
  - Demyelination
    - Relapsing, remitting course
    - Peripheral; < 1/2 area
    - 90% have intracranial lesions
  - Neoplasm
    - Slower onset
    - Cord expansion, Enhancement, Extensive edema, cystic change
  - Fistula
    - Prominent pial veins
    - Slower onset

- **Etiology**
  - Idiopathic
  - Atherosclerosis
  - Thoracoabdominal aneurysm
  - Aortic surgery
  - Emboli
  - Spinal AVM
  - Vasculitis
  - Aortic/Vertebral dissection
  - Hypotension
  - Infection
  - Vessel occlusion typically radicular branch of vertebral artery (cervical) or aorta (thoracic and lumbar)

Cord Infarct

Acute onset paraparesis

Myelitis

- Vessel occlusion typically radicular branch of vertebral artery (cervical) or aorta (thoracic and lumbar)
Case 3

- Differential
  - Tumour
    - Myxopapillary ependymoma
    - Lymphoma
    - Metastases
    - Nerve Sheath
    - Meningioma

Case 3

- Differential
  - Tumour Progression
  - Radiation Changes
  - Dural Arteriovenous Fistula

Spinal Vascular Malformations
Anson/Spetzler Classification

- Type 1 – dural AV fistula
- Type 2 – intramedullary AVM
  - Direct arterial/venous communication forming nidus in cord
- Type 3 – juvenile AVM (intramedullary, extramedullary)
- Type 4 – intradural perimedullary AVF
  - Direct arterial/venous communication from ASA or PSA to draining vein without capillary bed
Spinal Vascular Malformations
Modified Classification

• Neoplasms
  – HMB, cavernous malformations
• Aneurysms
• Arteriovenous lesions
  – AVF
    • Extradural (connection between epidural artery and vein, high flow fistula, engorged epidural venous system)
  – Intradural
    • Ventral
    • Dorsal (most common)
  – AVM

Dural AV Fistula

• 80% of all spinal vascular malformations
• Clinical
  – Progressive lower extremity weakness
  – Back pain, bowel/bladder dysfunction
  – 80-90% males, 4-5th decade

Dural AV Fistula

• AVF within the dura
  – Extramedullary, no intervening network of vessels
  – Drains directly into venous outflow (intradural vein drain into cord pial veins)
  – Supplied by small arteries originating from dura (dural branch of a radicular artery)
  – Most commonly between T5 and L3
  – Increased pressure and engorged pial veins
  – Increased pressure to intrinsic veins of cord, reducing intramedullary AF pressure gradient
  – Reduced tissue perfusion causing cord hypoxia

• MR
  – Enlarged, high T2 cord (spare periphery)
  – Dilated pial veins (intradural, extramedullary flow voids) – enhancing
  – +/- cord enhancement
  – Hemorrhage not common

• DDx
  -Tumour with prominent feeding vessels
  -CSF pulsation artifact
  -Spinal cord AVM
  -Spinal stenosis – causing tortuous nerve roots

Case 4

[Images of MR scans showing dural AV fistula]
Case 4

• Tumour Differential
  – Primary
  – Metastatic Disease
  – Lymphoma

Case 4

• Intramedulary tumours (4-10% of all CNS tumours)
  – Ependymomas (60% of cord gliomas)
  – Astrocytomas (1/3 of cord gliomas)
  – Hemangioblastomas 1 – 7.2%
  – Gangliogliomas 0.4-6.25%
  – Paragangiomas
  – Subependymomas
  – Mets 0.9 – 2.1%
  – Lymphoma

Spinal GBM

• Rare; 0.2 – 1.5% of spinal cord astrocytomas
• Etiology
  – De novo
  – Radiation
  – Intracranial dissemenation
• Younger patients, thoracic region
• High rate of CSF dissemination

END