Imaging the Spinal Cord & Intradural Disease

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Spinal Cord Diseases

- Tumors
- Syringohydromyelia
- Trauma
- Ischemia / Infarction
- Vascular malformations
- Inflammatory / Degenerative
Spinal Cord Tumors

- Ependymoma
- Astrocytoma
- Oligodendroglioma
- Hemangioblastoma
- Teratoma, epidermoid, dermoid, lipoma
- Metastases
Spinal Cord Tumors

Imaging Features

- Expansion of the cord
- Heterogeneous T2 signal
- Cysts & necrosis
- Variable enhancement
History: 58 y/o man with neck pain & paresthesias in fingertips
Dx: Ependymoma
History: 43 y/o male with bilateral arm paresthesias & weakness
Dx: Pilocytic astrocytoma
History: 19 y/o male with progressive leg weakness for 2 years
Dx: Pylocytic astrocytoma
Hemangioblastoma
History: 55 y/o woman with pain & tingling in the extremities

Dx:
Dorsal Dermal Sinus with Dermoid Tumor
History: 69 y/o man with progressive weakness in his arms & legs
Dx: Lung CA
History: 40 y.o. man with pain & paresthesias in both arms & shoulders
Dx: NF 2 with intramedullary neurofibroma
Chiari I with syrinx
History: 22 y/o male with brain stem dysfunction

Dx: Chiari I malformation with syringohydromyelia
History: 45 y.o. male with a progressive myelopathy
History: 31 y/o woman with severe back pain
Dx: Pilocytic astrocytoma
History: 56 y/o man with C6 quadriplegia following an MVA 5 years ago
Dx: Old cord contusion with post-traumatic syrinx and cord atrophy
Spinal Cord Cysts

Evidence for Benign Syrinx

- Fluid isointense to CSF
- Smooth, well-defined internal margins
- Thinned adjacent parenchyma
- Cord atrophy
- No contrast enhancement
- Presence of Chiari malformation
Spinal Cord Masses

Non-Tumorous Lesions

- Cord contusion
- Multiple sclerosis
- Vascular malformation
- Parasitic disease
- Abscess
- Sarcoidosis
History: 18 y/o male became tetraplegic while surfing in Puerto Vallarta
Dx: Fractures C3 & C4; Posterior ligamentous injury; Cord contusion

Tetraplegia {Page 3}
History: 44 y.o. man
fell off a roof onto his head
History: 35 woman with MS

T2 FSE

STIR

PD

T1 FSE
Dx: MS

T2 FSE

Dx:

MERGE
History: 27 y/o woman with muscular dystrophy & new left sided numbness

Dx: Transverse myelitis (ADEM)
History: 23 y/o female with leg weakness & sensory changes
Dx: Neuromyelitis optica – Devic's disease

2 years later
History: 95 y/o woman with acute bilateral upper extremity weakness
Intramedullary AV Malformation
History: 36 y/o man with a chronic C6-8 radiculopathy
Tuberculoma of the Spinal Cord
Schistosomiasis

T1W

T1W+GD

Courtesy of Bassem Georgy, San Diego, California
Intradural Extramedullary Tumors

- Schwannoma / Neurofibroma
- Meningioma
- Metastatic disease
Primary Intraspinal Tumors

- Schwannoma: 35%
- Meningioma: 25%
- Glioma: 20%
- Vascular: 10%
- Sarcoma: 5%
- Other: 3%
- Chordoma: 2%
Schwannoma
History: 42 y/o woman with anterior chest pain & lower extremity weakness
Dx: Schwannoma
Nerve Sheath Tumors

- Originate from Schwann cells
- Associated with Neurofibromatosis
- Foraminal enlargement
- Intradural/extradural components
- Long T1, long T2
- Bright enhancement
History: 23 y/o male with cauda equina syndrome
Dx: Schwannoma
Neurofibromatosis Type 1
History: 54 male with leg weakness & a T3 sensory level

Dx:
Spinal Meningioma

- Arise from meninges - intradural
- Middle-aged females
- 80% in thoracic region
- MR signal similar to cord
- Intense enhancement
History: 43 y/o male with back & bilateral leg pain
History: 43 y/o man with back pain for several months
Dx: Hemangioblastoma
History: 35 y/o female with pain & weakness in both legs
History: 22 y/o female with flank pain & progressive leg weakness
Dx: Lymphocytic Leukemia
Intradural Metastases

- **CNS neoplasms** - "drop metastases"
  - Medulloblastoma, ependymoma
  - Pineal tumors, glioblastoma

- **Non-CNS neoplasms**
  - Breast, lung, melanoma,
    lymphoma, leukemia

- **Imaging**: Gadolinium with
  fat suppression
Intradural Metastases

MR Appearance

- Nodular masses
- Coating of cord & nerve roots
- Gelatinous & non-enhancing
- Intramedullary
History: 59 y/o man with increasing leg weakness
Dx: Melanoma with drop mets
Cerebellar Glioblastoma with Diffuse Pial Seeding
Medulloblastoma with Leptomeningeal Seeding
Infection and Inflammation

Intradural

- Meningitis
- Sarcoidosis
- CMV polyradiculopathy
- Guillain Barre syndrome
- Arachnoiditis
Chronic Cocci Meningitis
History: 37 man with progressive lower body weakness over 4 days
Dx: Gullain Barre
History: 54 y/o male s/p multiple surgeries with chronic back & leg pain
Dx: Chronic arachnoiditis with "empty sac sign"