ependymoma and astrocytoma

beginner dx of intramedullary spine neoplasm

ASTROCYTOMA

* Intramedullary metastasis
  + ddx
    - ependymoma (adult)
    - astrocystoma (child)
  + post-con appearance
    - circumscribed
  + how to distinguish from ependymomma
    - Met typically more eccentric
* Oligoastrocytoma
  + intramedullary
    - del
* Ganglioglioma
  + intramedullary
    - margins
      * circumscribed
    - MRI app
      * looks like ependymoma
* Subpial lipoma
  + del
* Extramedullary-intradual lesions
  + MC tumors
    - Neurogenic: schwannoma/neurofibroma
    - Meningioma
    - Myxopapillary ependymoma
* Myxopapillary ependymoma
  + del
* Schwannoma
  + spine, extramedullary
    - del
* Neurofibroma
  + spine, extramedullary
    - del
* Nerve sheath tumors
  + spine, extramedullary
    - how to distinguish
      * you can’t
* Meningioma
  + intradural, extramedullary
    - typical region
      * cervico-thoracic
  + T2, enhancement
    - typically iso T2, homogenous enhance
* Hemangiopericytoma
  + del
* Myxopapillary ependymoma
  + intradural-extramedullary
    - typical region
      * lumbar spine
      * arises from filum terminale
    - ddx
      * nerve sheath tumor
    - typical age
      * young adult
      * teenager
    - classic feature if large
      * boney scalloping, filling the spine
* Paraganglioma
  + intradural-extramedullary
    - typical region
      * lumbar
      * arise from cauda equina
* Epidermoid cysts
  + intradural-extramedullary
    - how to get iatrogenically
      * do an LP without the stylette in the needle
* Dermoid cysts
  + intradural-extramedullary
    - contrast epidermoid on appearance
      * fat bright signal component
      * otherwise it looks the same because, histologically there is an epidermoid component
* Drop metastases
  + del

“Lumbar disc nomenclature 2.0” 2014; read it

* Disc buldge
  + criteria
    - > 25% circumference
    - (hernia if less)
* Disc herniation
  + protrusion vs extrusion
    - protrusion: wide base, annulus fibrosis intact
    - extrusion: narrow neck, requires tear of all fibers of the annulus fibrosis
    - signal
      * extrusion typically brighter on T2. don’t confuse with nerve tumor
  + sequestration
    - extrusion that has lost connection to disc
    - but this is uncommon and you are likely to be wrong and it’s just an extrusion
  + subarticular
    - aka
      * paracentral
  + foraminal
    - aka
      * lateral
      * (this is confusing, don’t use lateral)
* Degenerative endplate changes (Modic)
  + aka for Modic 1-3
    - 1 – edema type
    - 2 – fatty type
    - 3 – sclerotic
  + type 1
    - signal
      * like edema: T2 high, T1 low, enhances
    - contrast discitis
      * no destructive change of cortical black lines
      * no paraspinous epidural dz (eg, abscess, edema)
      * (but there is an overlap very early in discitis. AIRP presenter will do bx if CRP elevated and concerned for infect.)
  + type 3
    - del
* Facet arthropathy
  + del
* Ligamentum flavum buckling
  + del
* Synovial cysts
  + noninvasive tx
    - insuflation based rupture (inject anesthetic until it ruptures)
* Failed back surgery syndrome (FBSS)
  + del
* Recurrent disc herniation
  + scar is bright and enhances
  + new herniation is low signal
  + caution if using enhancement char only
    - acute herniation can enhance depending on delay of scan
    - but pre con T1, T2 should be low
    - granulation tissue is bright on T2 (if not accute)
* Post-op discitis
  + del
* Arachnoiditis
  + pathogenesis
    - subarachnoid adhesions
  + the nerve roots are adherent to the walls of the thecal sac
    - << empty thecal sac sign
* Epidural scar
  + del
* Congenital spinal canal stenosis
  + etiologies
    - pedical hypoplasia (less space ant to facet on sag)
    - lamanar clear space is narrowed (less space ant to spinous process on sag)
    - (can tell on sag plain film)
* Acquired spinal canal stenosis
  + del
* Ossification of the posterior longitudinal ligament (OPLL)
  + tx
    - requires corpectomy if spinal canal stenosis
* Ossification of the ligamentum flavum (OFL)
  + del

INFLAMMATORY DZ OF THE SPINE

* Discitis-Osteomyelitis
  + mc pathogen
    - S. aureus
* Tuberculous osteomyelitis
  + appearance in spine
    - affects multiple level vertebral bodies, skipping the discs

VASCULAR DISEASE

* Spinal AVM
  + mc lesion, contrast brain
    - dural AVF
    - if in brain: AVM
  + type 1-4
    - 1: dural AVF
    - 2: glomus AVM
    - 3: juvenile AVM
    - 4: pial AVF
* Spinal dural AVF
  + pathogenesis, MC presentation
    - shunting -> venous congestive myelopathy -> progressive myelopathy
  + classic findings
    - increased number of flow voids around spine (add pic, not always this obvious, later pic with large vessel and early pic with tiny vessels)
    - diffuse cord edema & enhancement
  + << pic of angio from slide
  + << ants on a log appearance of spine
* Spinal glomus AVM
  + appearance
    - intra-axial, like an AVM in the brain
  + << intramedullary bag of worms
  + << pic of angio from slide
* Spinal juvenile AVM
  + aka
    - metameric AVM
    - Type 3
  + assoc syndrome
    - Cobb syndrome
  + appearance
    - large AVM not confined to thecal space, straddles multiple compartments (ant, post columns, cord)
* Spinal pial AVF
  + aka
    - perimedullary AVF
  + appearance
    - looks like a dural AVF
  + contrast dural AVF
    - location of fistula is surface of cord (pial, it’s all in the name)
    - but much more rare
* Spinal cavernous malformations
  + if post gad enhancement or edema?
    - recent hemorrhage
  + classic appearance
    - blooming artifact ring
* Cord infarct
  + MRI appearance
    - like a stroke in the brain (high DWI, low ADC, high T2, etc)
* Spinal venous ischemia
  + del
* Subarachnoid hemorrhage
  + del
* Subdural hematoma
  + del
* Epidural hematoma
  + del
* Meningeal cysts
  + << generic term for CSF density cyst in spine
  + type 2
    - aka
      * Tarlov cyst
      * perineural cyst
    - assoc with nerve?
      * nerve usually traveling through or along wall of cyst
  + type 3
    - location
      * intradural
    - aka
      * intradural arachnoid cyst
    - myelogram appearances
      * either a filling defect (add pic)
      * or it may fill in completely with contrast
  + type 1
    - location
      * extradural
  + type 1B
    - aka
      * occult sacral meningocele
* Ventral spinal cord herniation
  + location
    - always thoracic
  + cord itself herniates out through an anterior dural defect
  + appearance
    - cord hugging wall of thecal sac and focally narrowed
    - add pic
  + ddx
    - subarachnoid cyst
    - arachnoid web
    - (dorsal and pushing cord anterior)