How should we investigate children with lower urinary tract symptoms and a sacral dimple?

- Review of the imaging options available

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How should we investigate children with lower urinary tract symptoms and a sacral dimple?

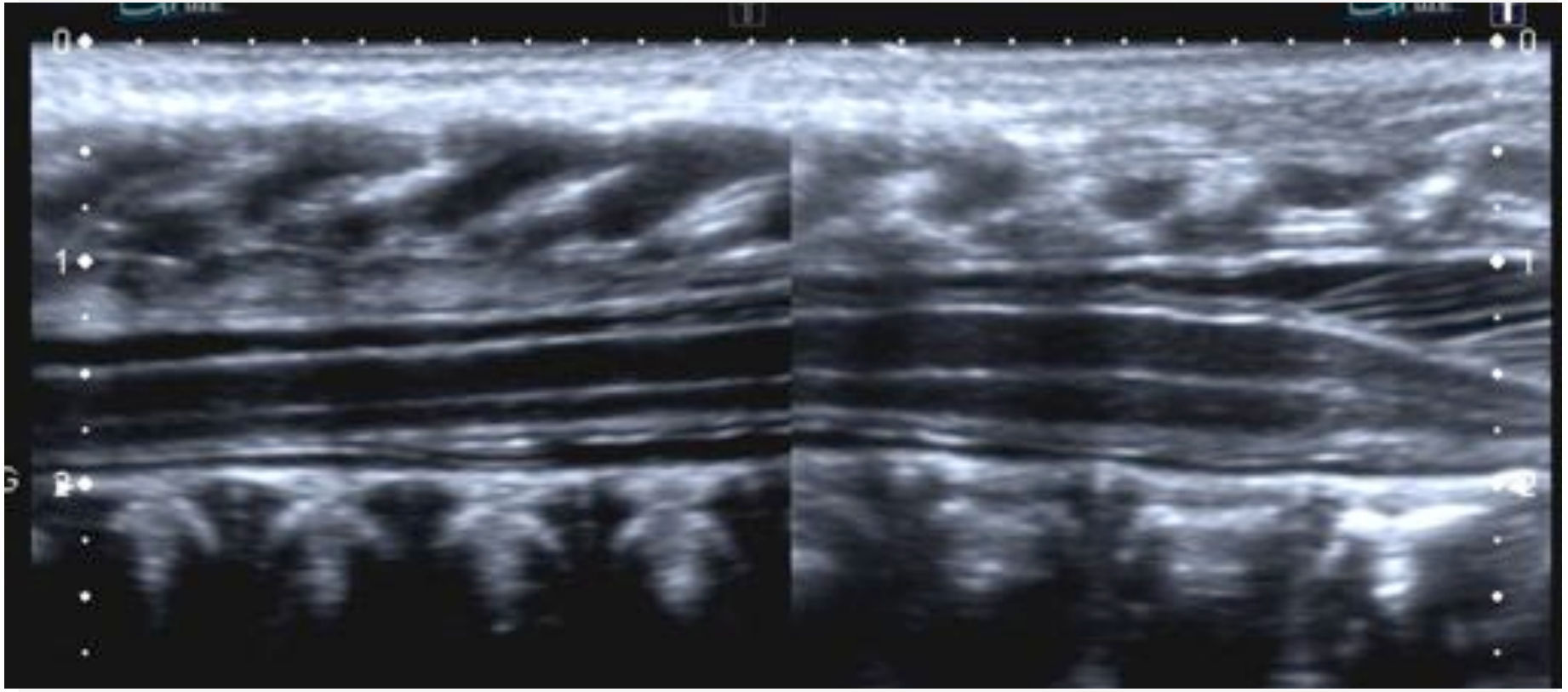
- Review of the imaging options available
  - Ultrasound
  - MRI

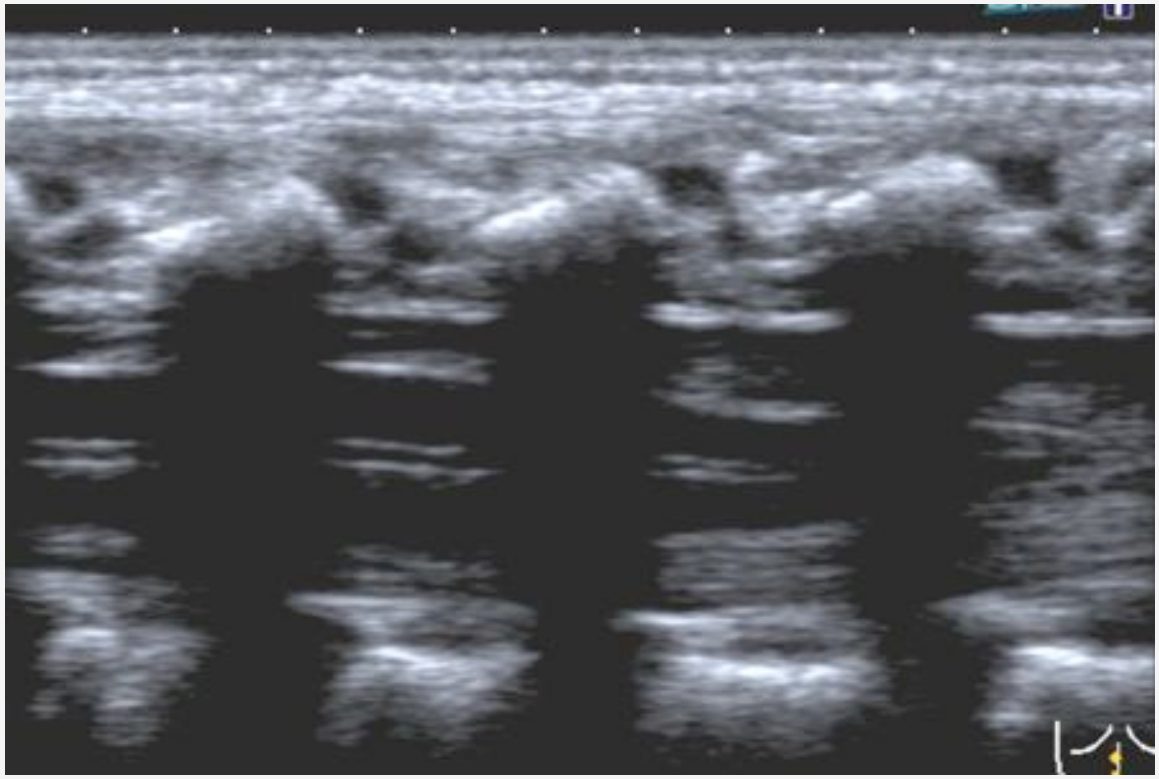
Imaging

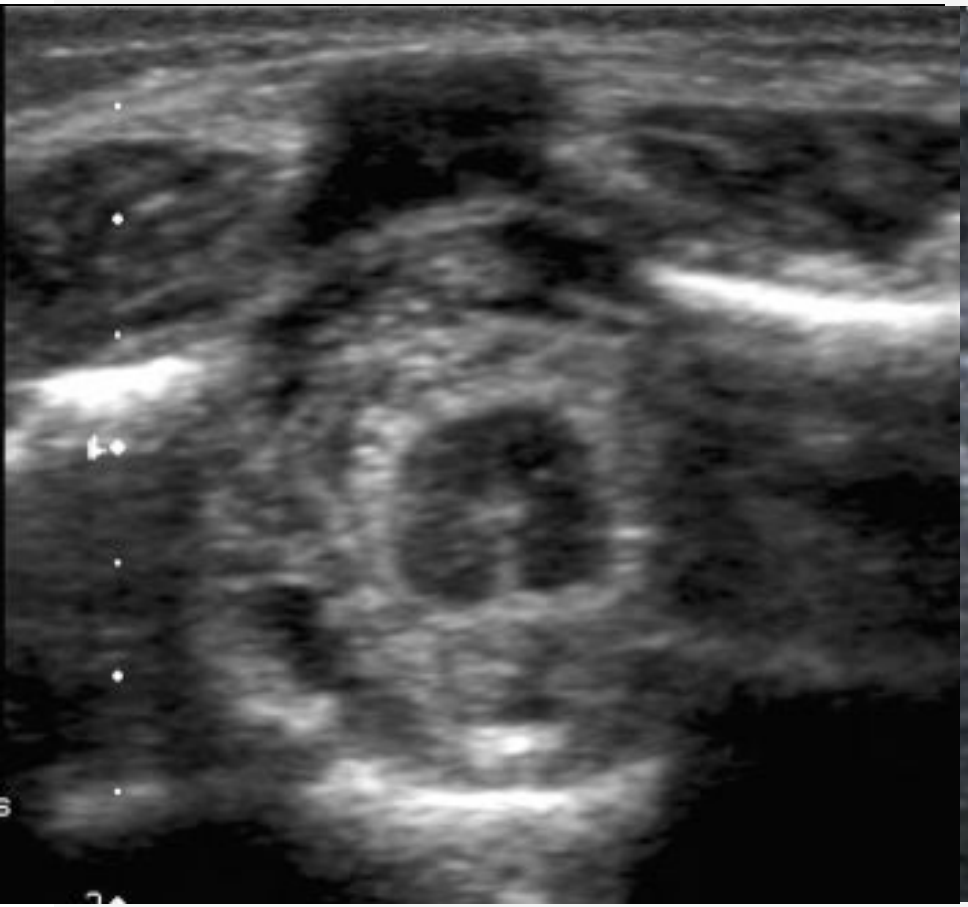
- Imaging modality
  - Ultrasound
    - 'Patient friendly'
    - Possible in early infancy (first 3 months)
    - Spinal defect – might provide a window
    - Excellent spatial resolution
    - Good sensitivity
    - Real-time imaging
    - Limitations
      - User dependent
      - Complex abnormalities
      - (Open neural tube defects)

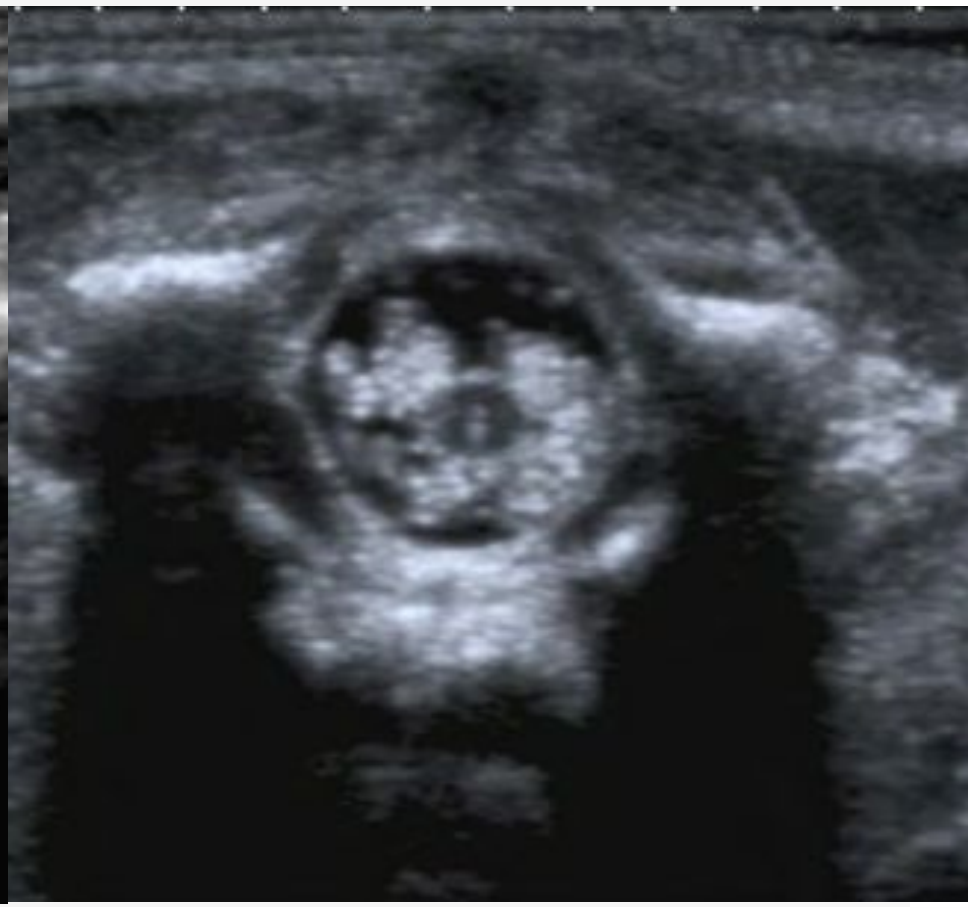
Imaging

- Imaging modality
  - MRI
    - Optimal combination of contrast resolution, spatial resolution, anatomical depiction, etc
    - Shows structures hidden on US
    - Usually requires sedation or GA
    - Challenges – body size, movement, coils, tissue contrast, cardiac and CSF pulsation
  - (plain radiograph)
  - (CT)





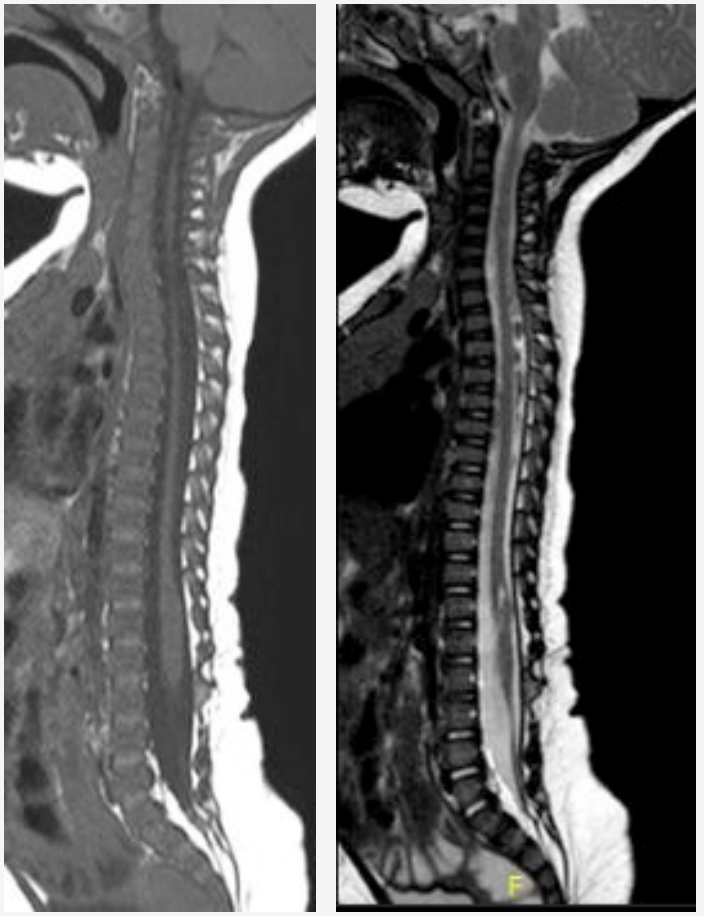




MRI

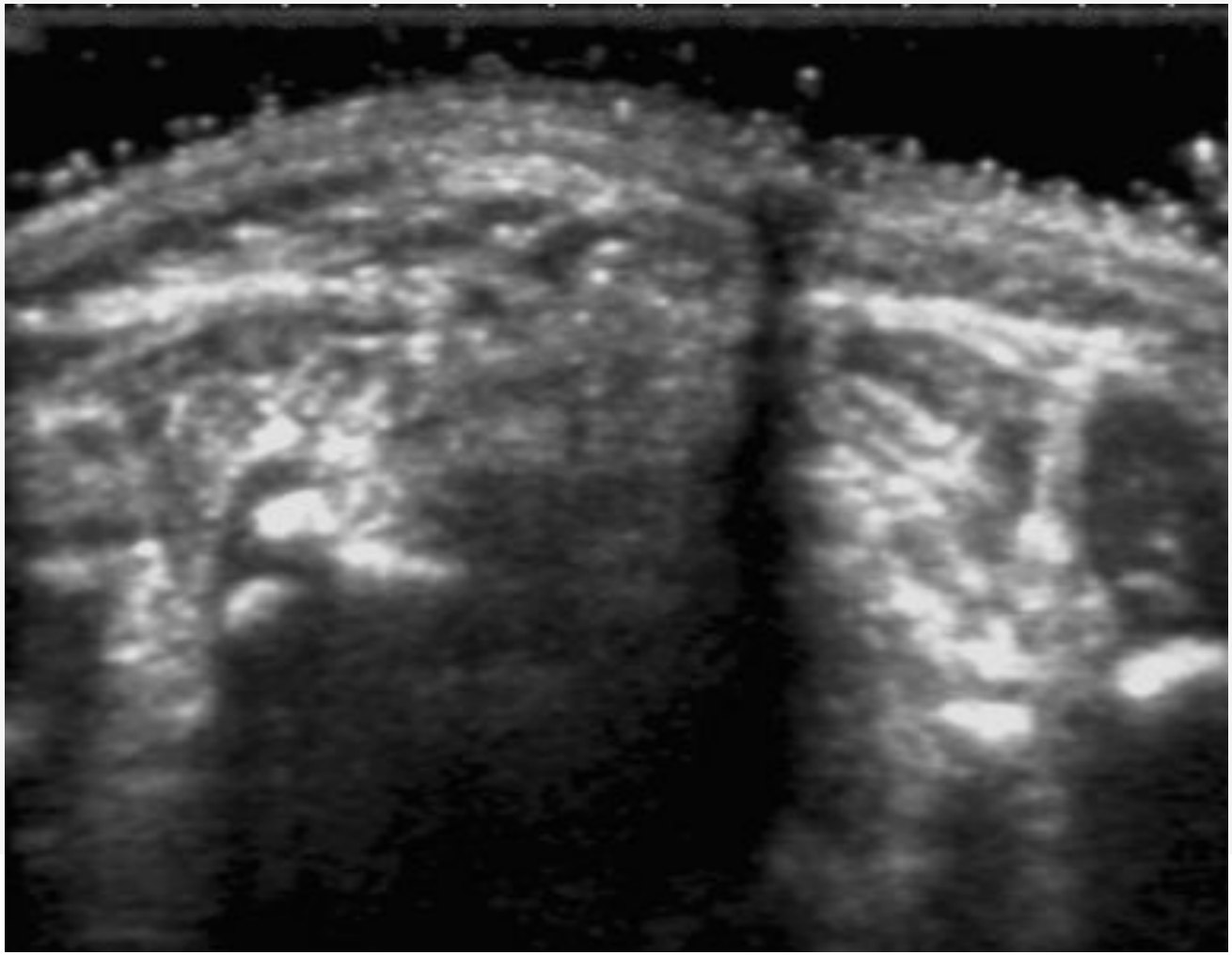
Protocol optimised to show: CSF, neural tissue, fat

- Whole spine sagittal T1 and T2
- L/S spine axial T1 and T2
- L/S spine sag CISS or FIESTA

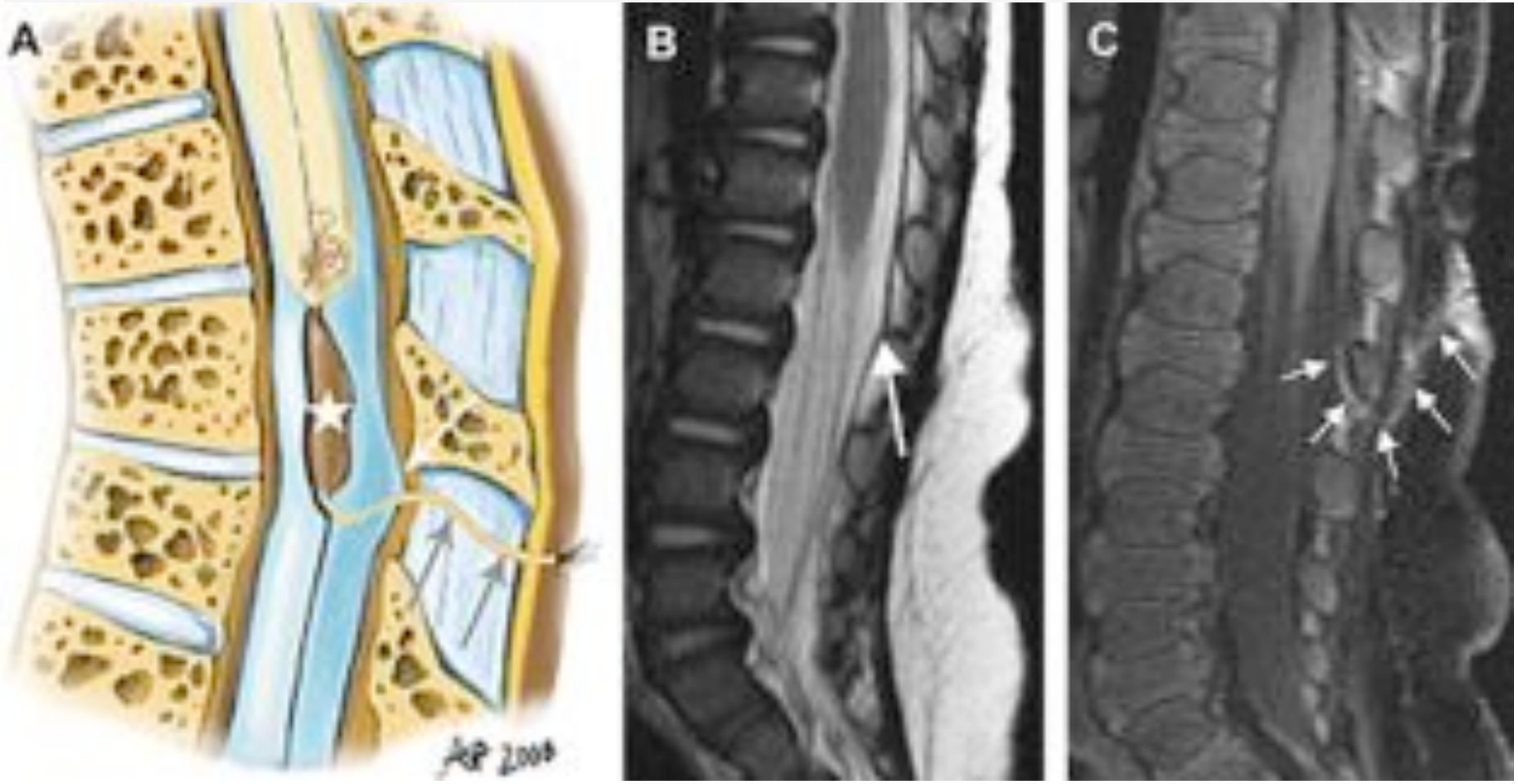


Example pathologies

Dermal sinus



DERMAL SINUS



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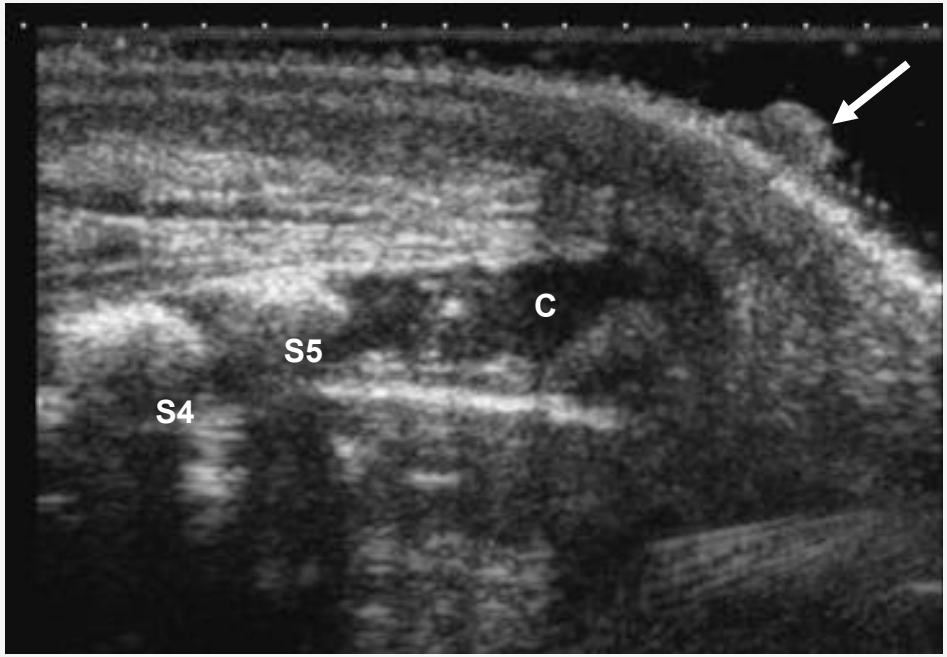
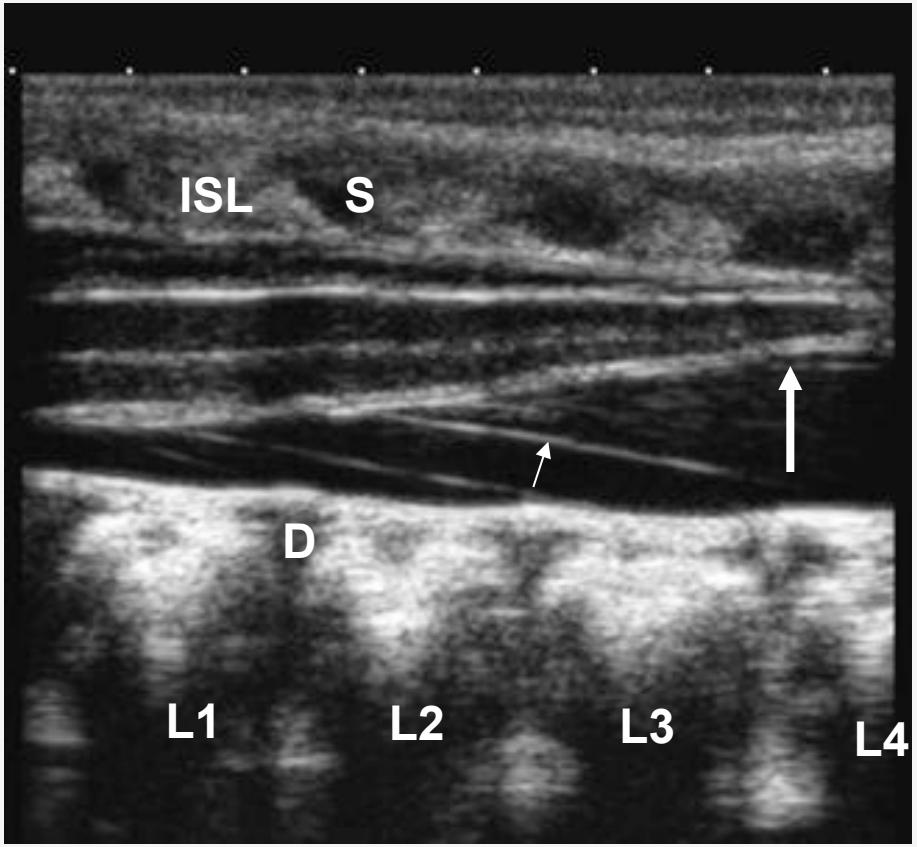


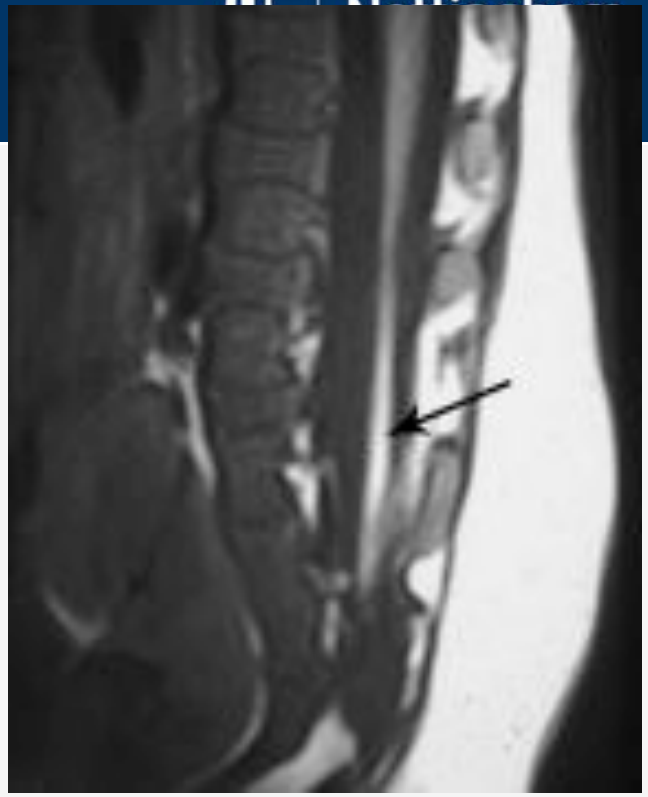
Sagittal image through the sacrum and coccyx. A small skin tag (arrow) is present overlying the caudal most part of the coccyx. There is focal distortion of the tip of the coccyx and disruption of the normal subcutaneous and deep fascial layers

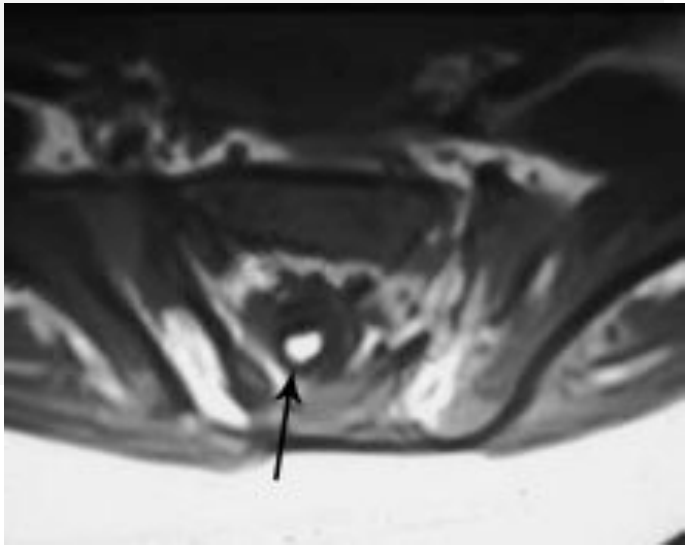
- Tethered cord



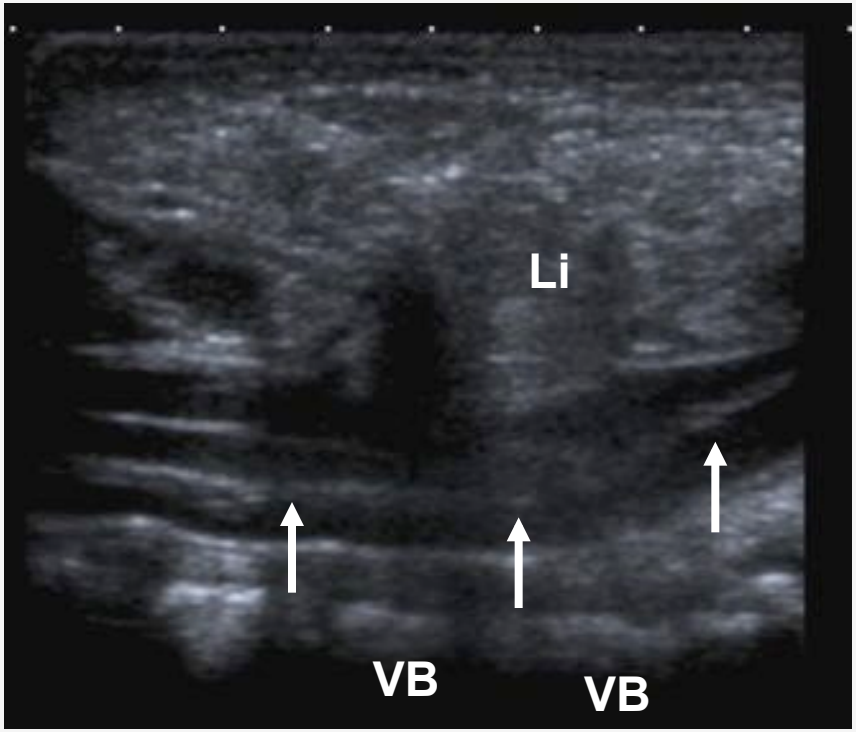
FILAR LIPOMA

- Fibrolipomatous thickening of the filum terminale
- Hyperintense strip of signal on T1-weighted within thickened filum terminale
- Considered a normal variant if there is no clinical evidence of tethered-cord syndrome



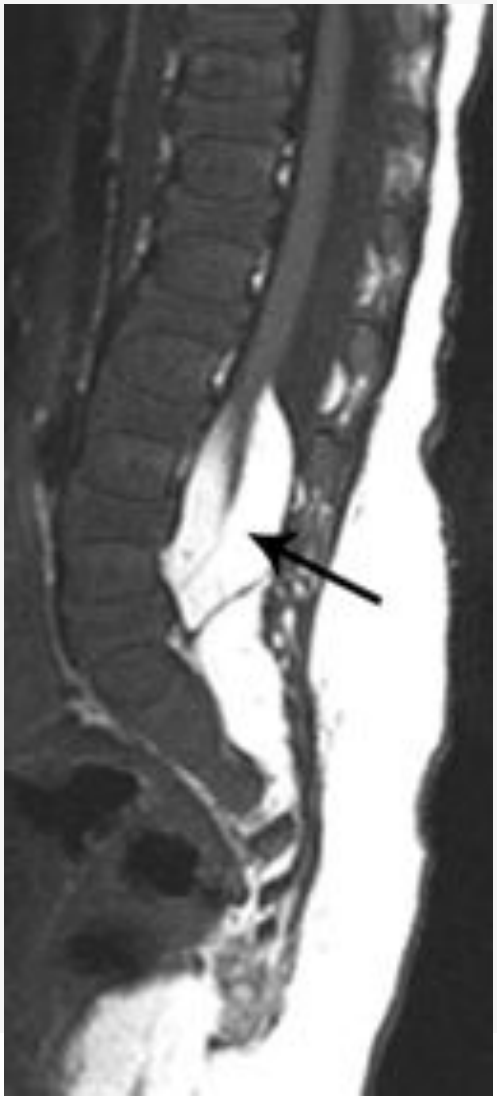


- Intradural lipoma



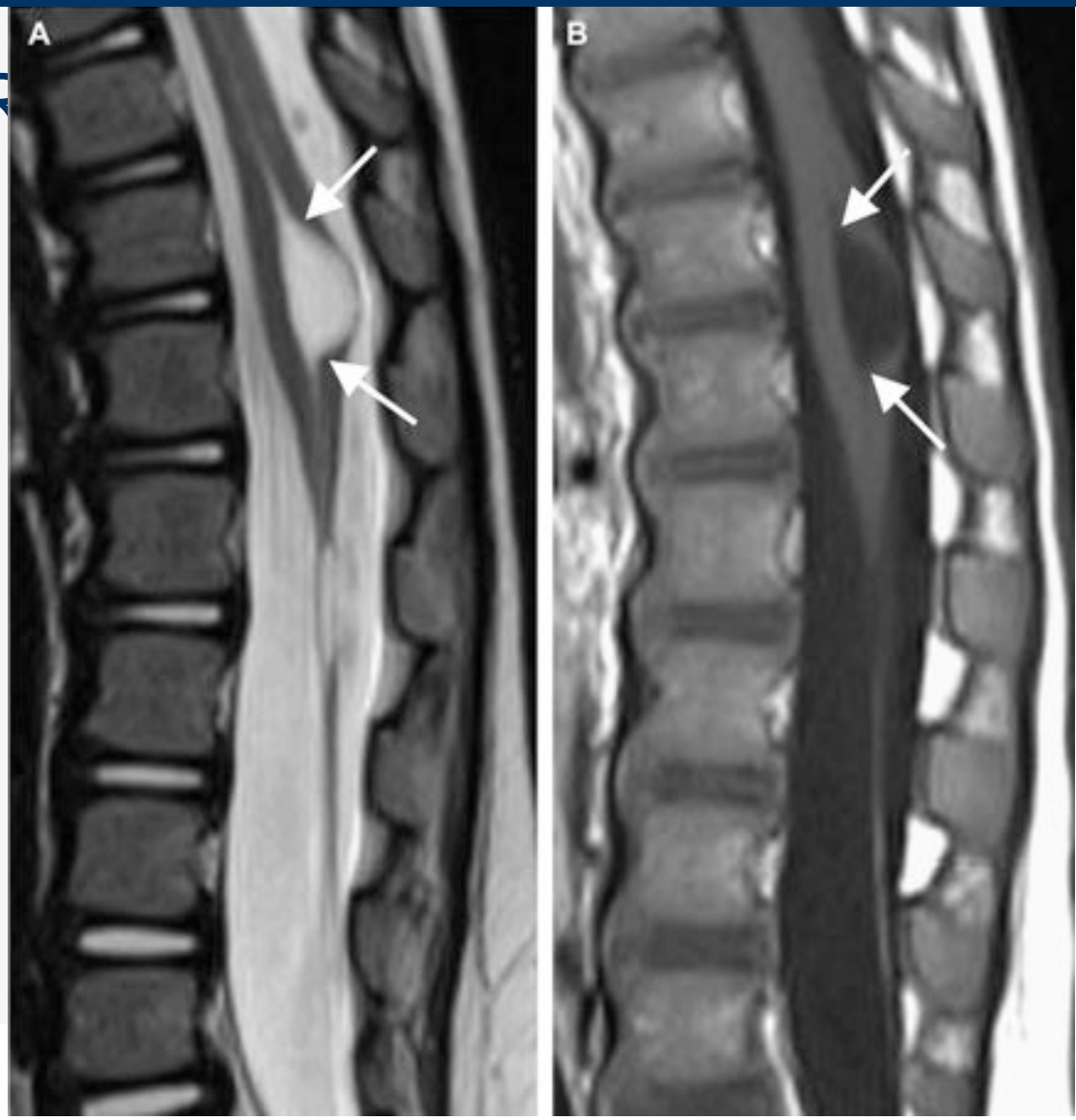
INTRADURAL LIPOMA

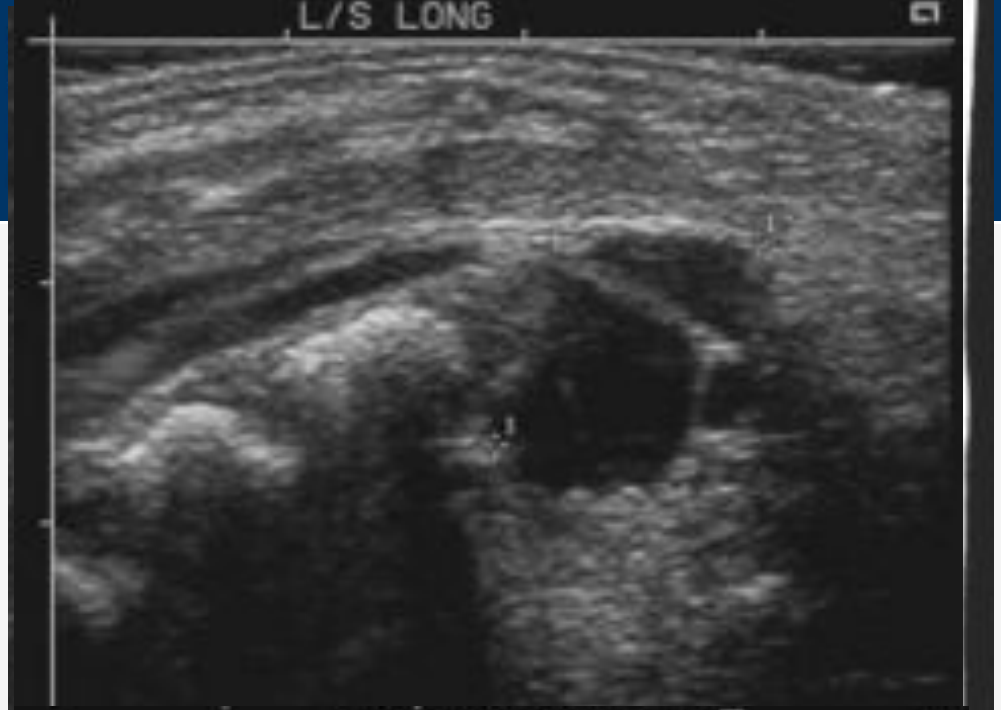
- Lipoma - contained within the dural sac
- No open spinal dysraphism is present.
- Most common lumbosacral in location
- Present with tethered-cord syndrome, a clinical syndrome of progressive neurologic abnormalities in the setting of traction on a low-lying conus medullari

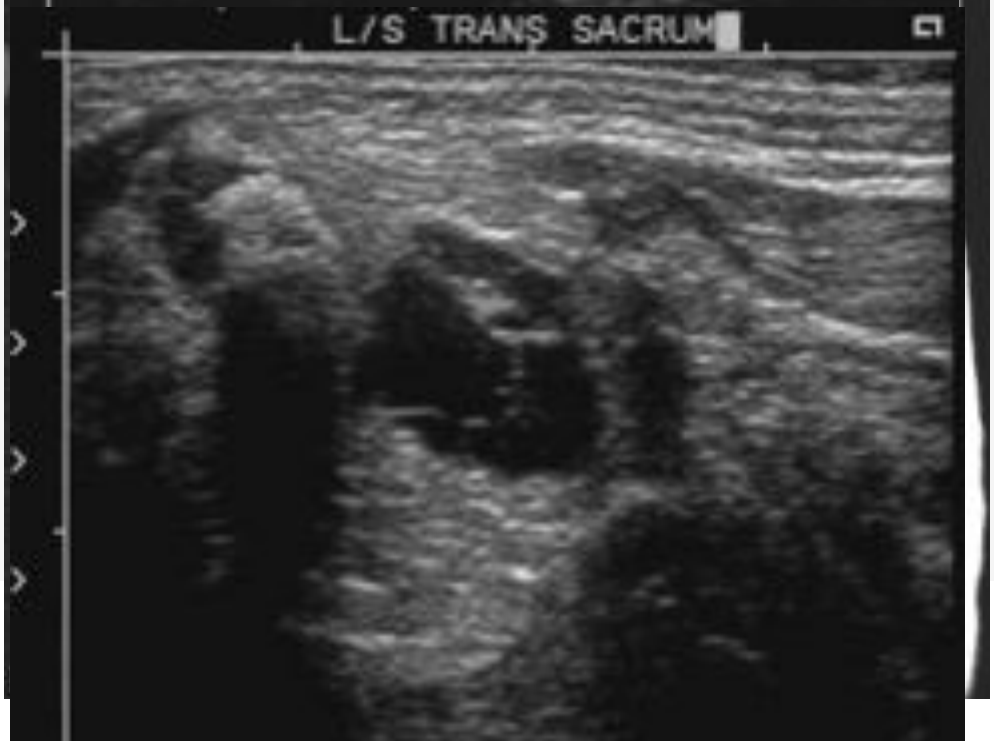


PERSISTENT TER

- Ependymal lined cavity within the conus medullaris
- Key imaging features include location immediately above the filum terminale
- Lack of contrast enhancement, which differentiate this entity from other cystic lesions of the conus medullaris





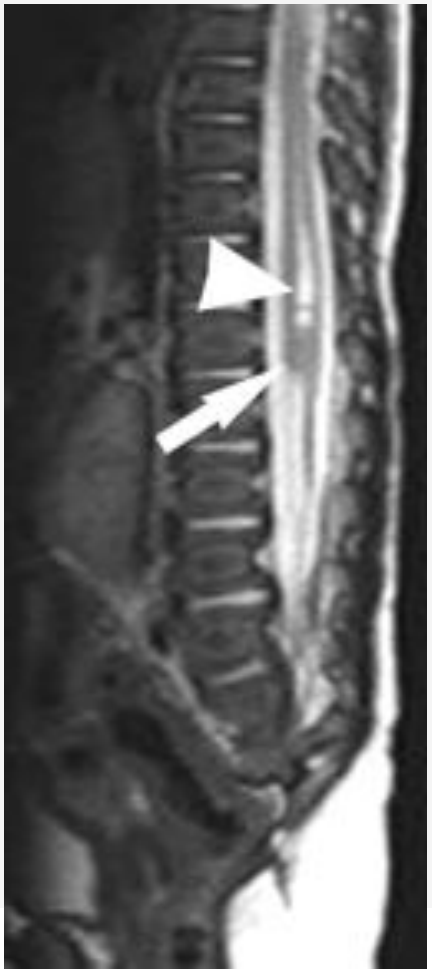


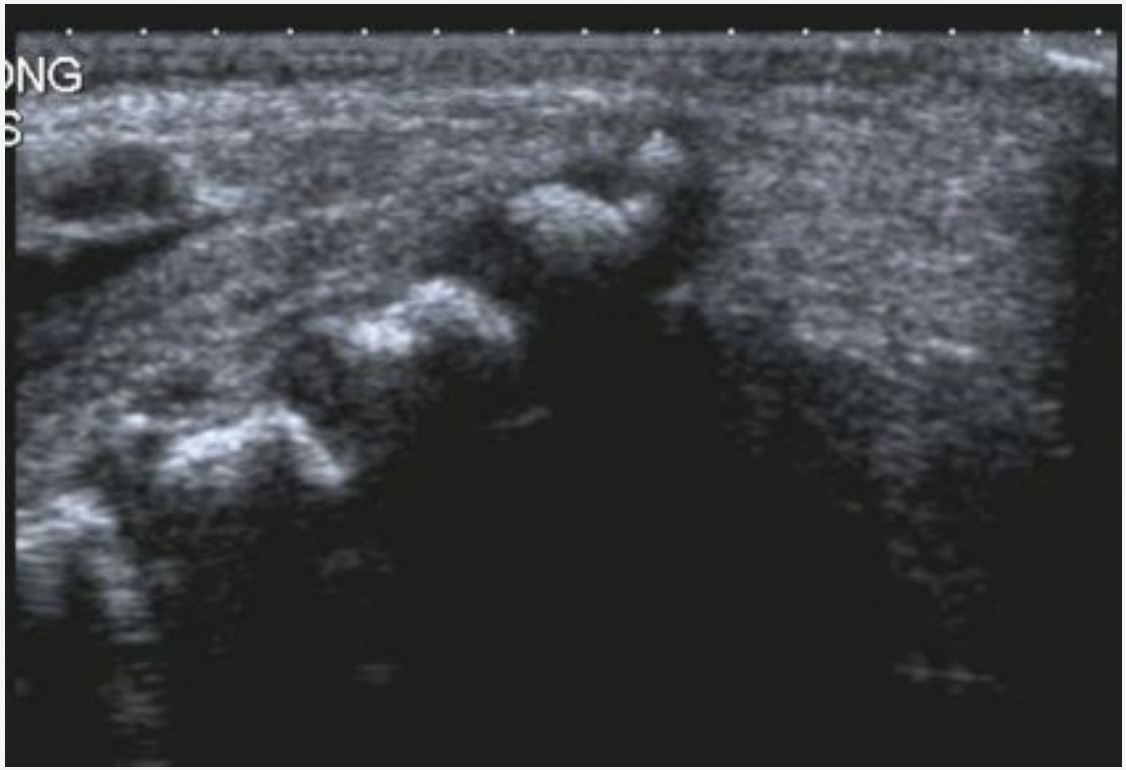
- Anterior sacral meningocoele

Caudal agenesis

- Total or partial agenesis of the caudal mass
- Associated with the following
  - Anal imperforation,
  - Genital, renal, pulmonary anomalies,
  - Limb abnormalities
- Two types.
  - Type 1 High position and abrupt termination of the conus medullaris.
  - Type 2 Low position and tethering of the conus medullaris

Caudal agenesis

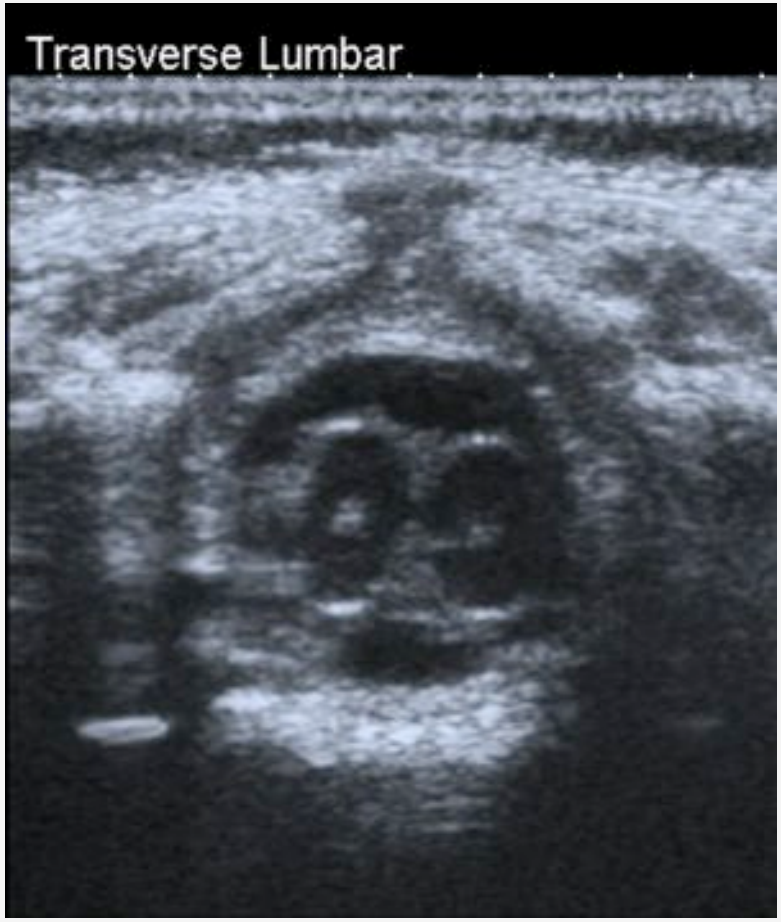




DIASTEMATOMYELIA

- Separation of the spinal cord into two hemicords is referred to as diastematomyelia.
- Hemicords are usually symmetric, although the length of separation is variable.
- Type I - Two hemicords are located within individual dural tubes separated by an osseous or cartilaginous septum
- Type 2 - Single dural tube containing two hemicords - an intervening fibrous septum
- Clinically with scoliosis and tethered-cord syndrome.
- Hairy tuft on the patient's back can be a distinctive finding on physical examination

Type II



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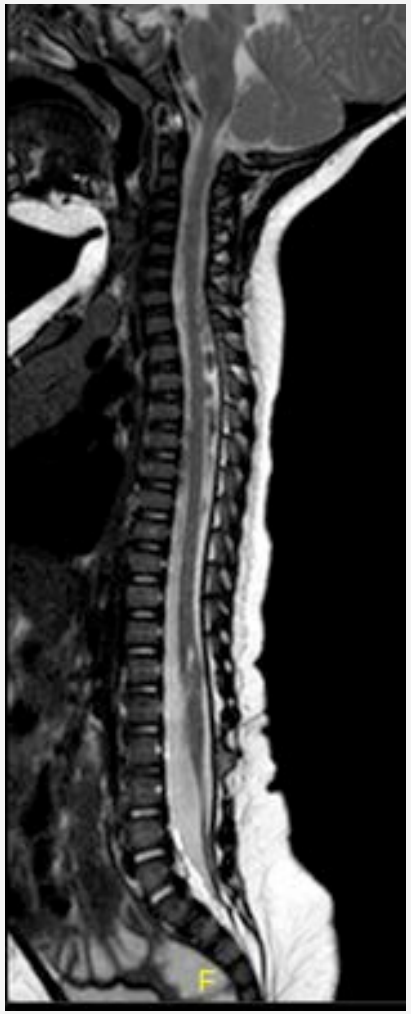
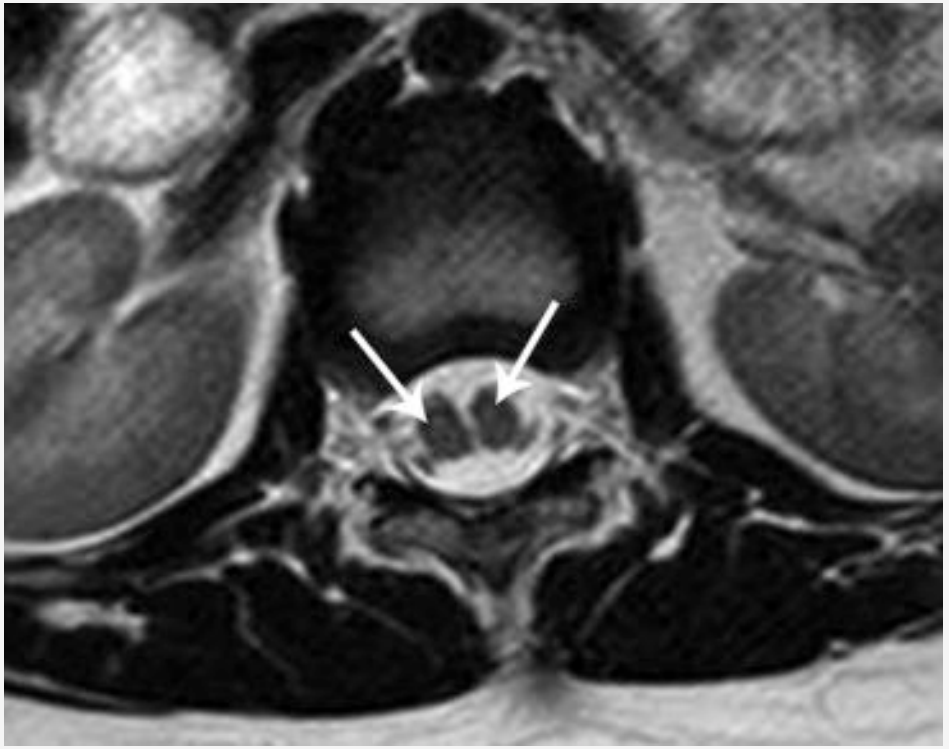
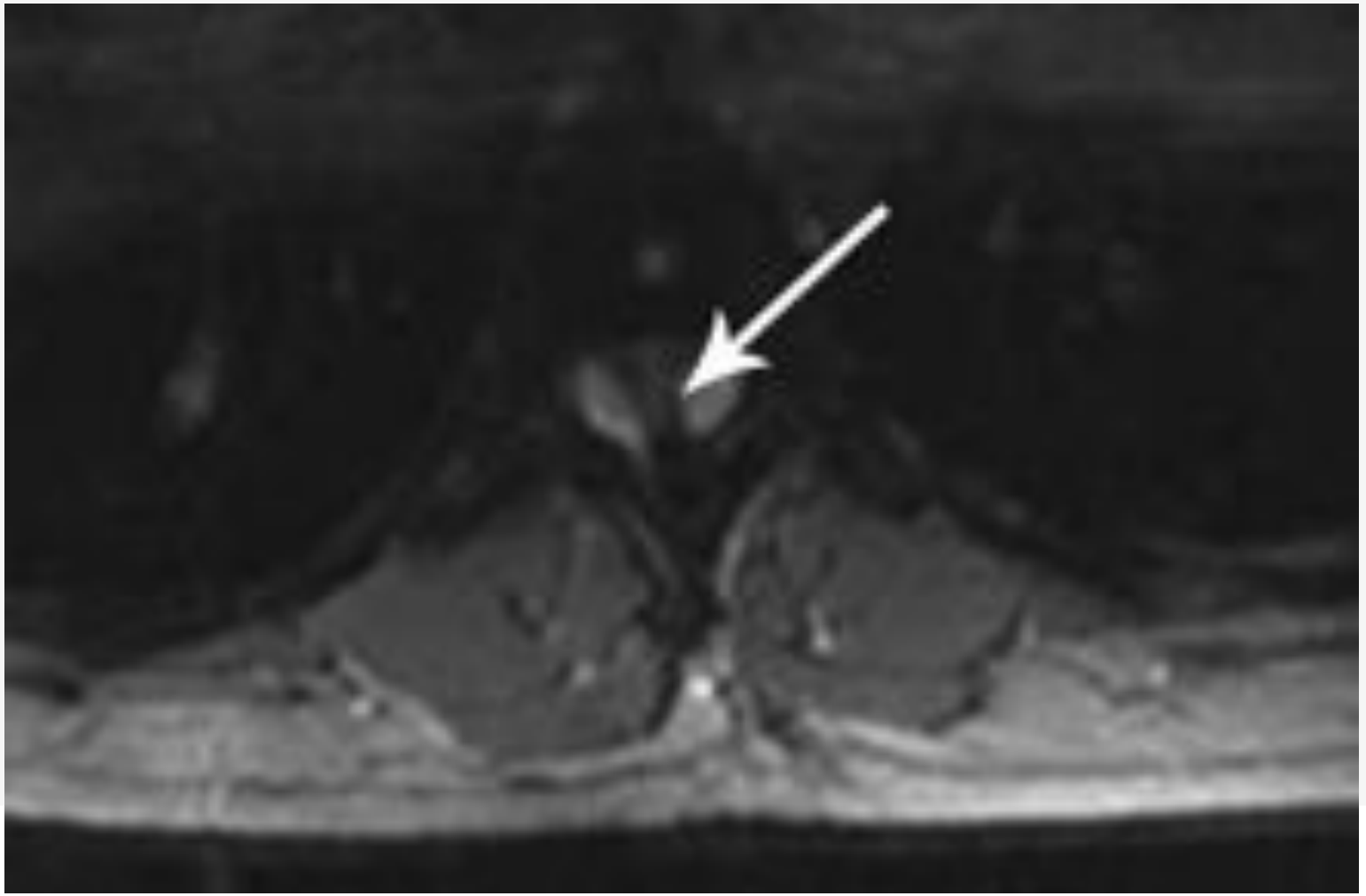
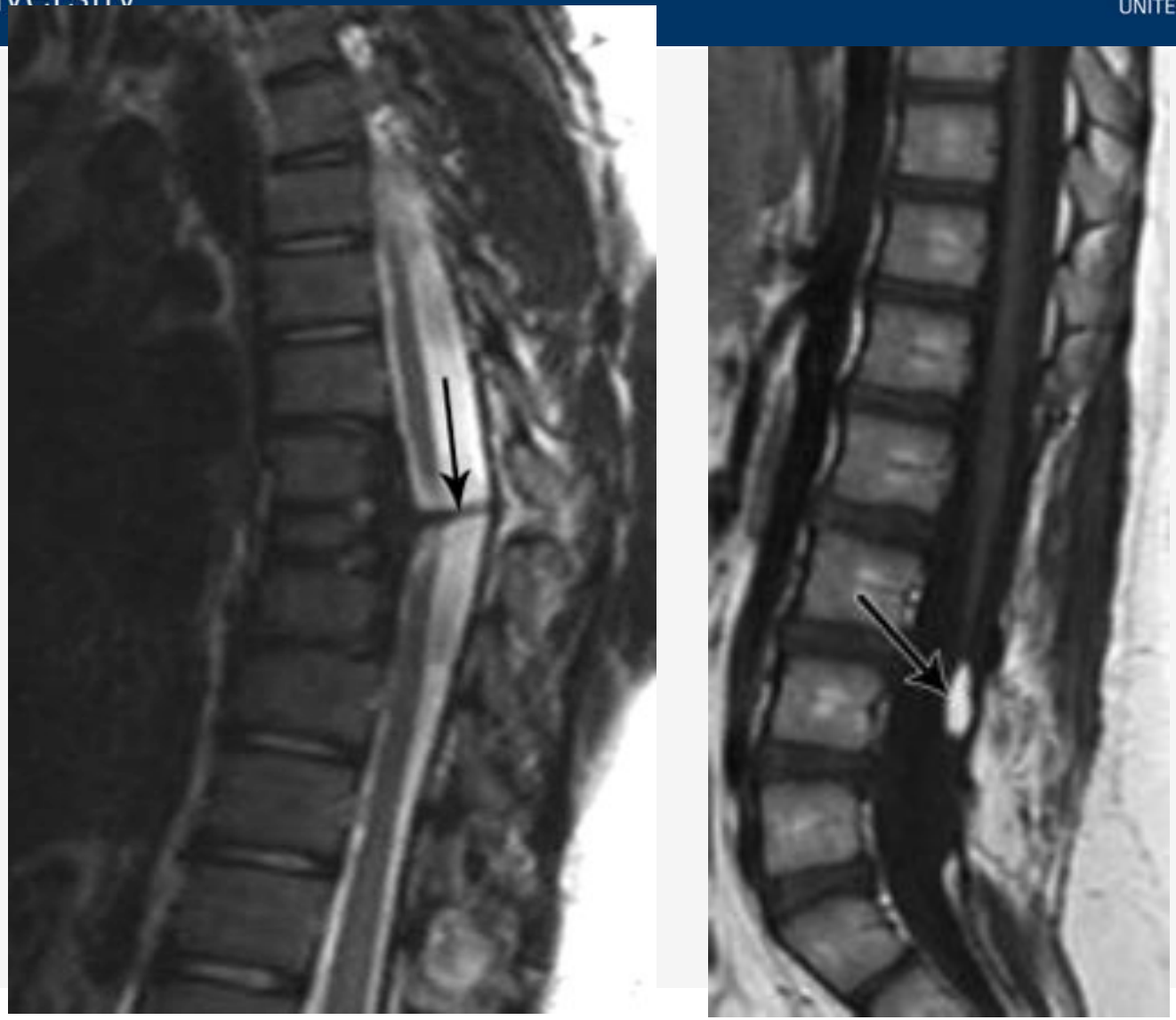




Type I





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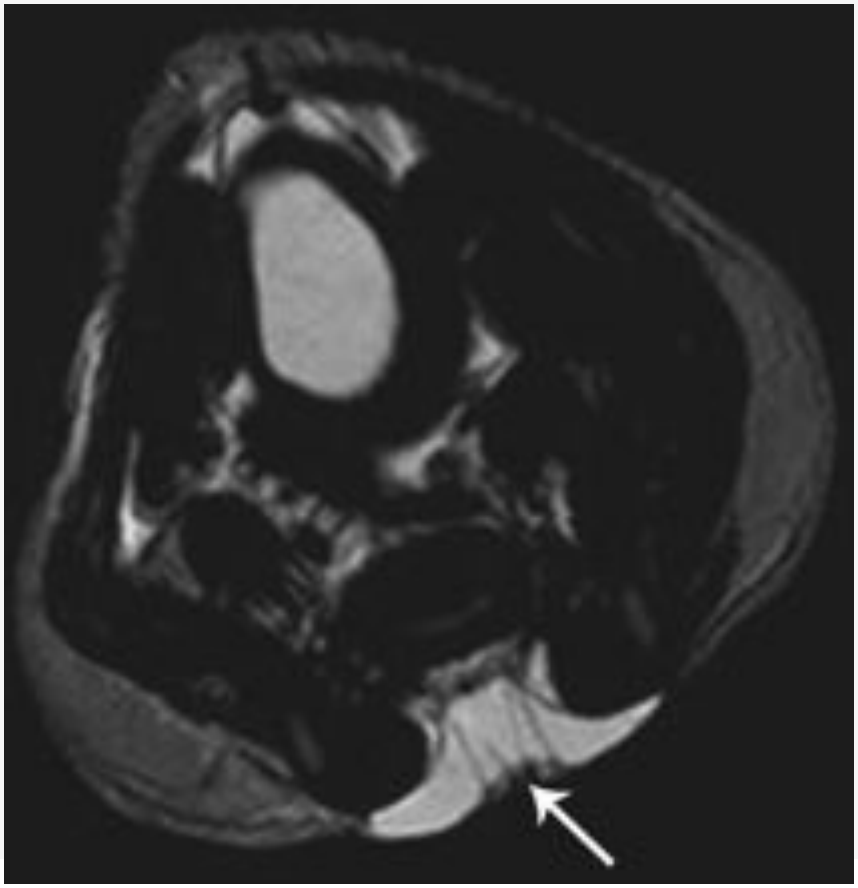
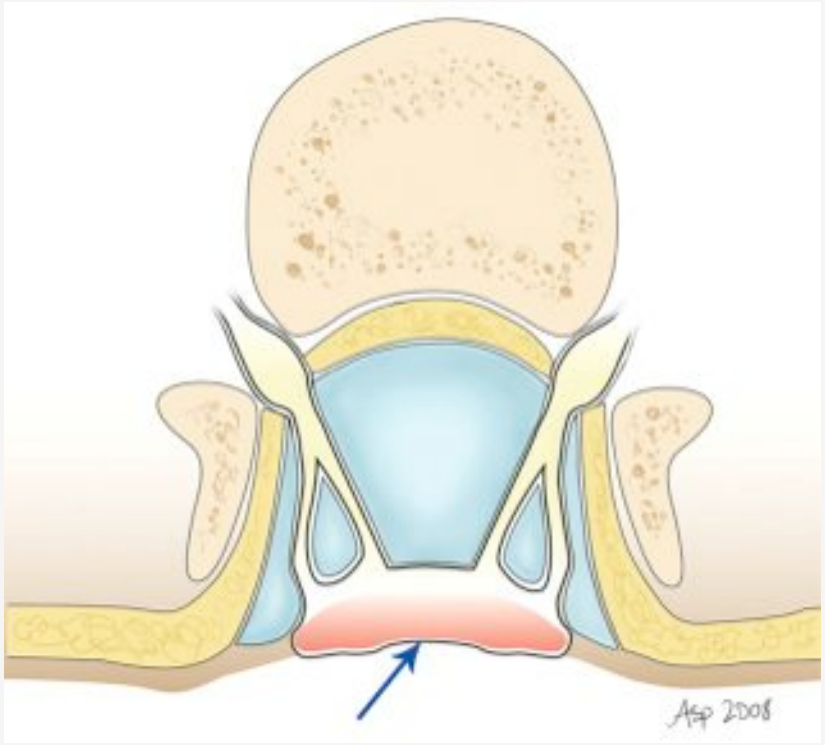
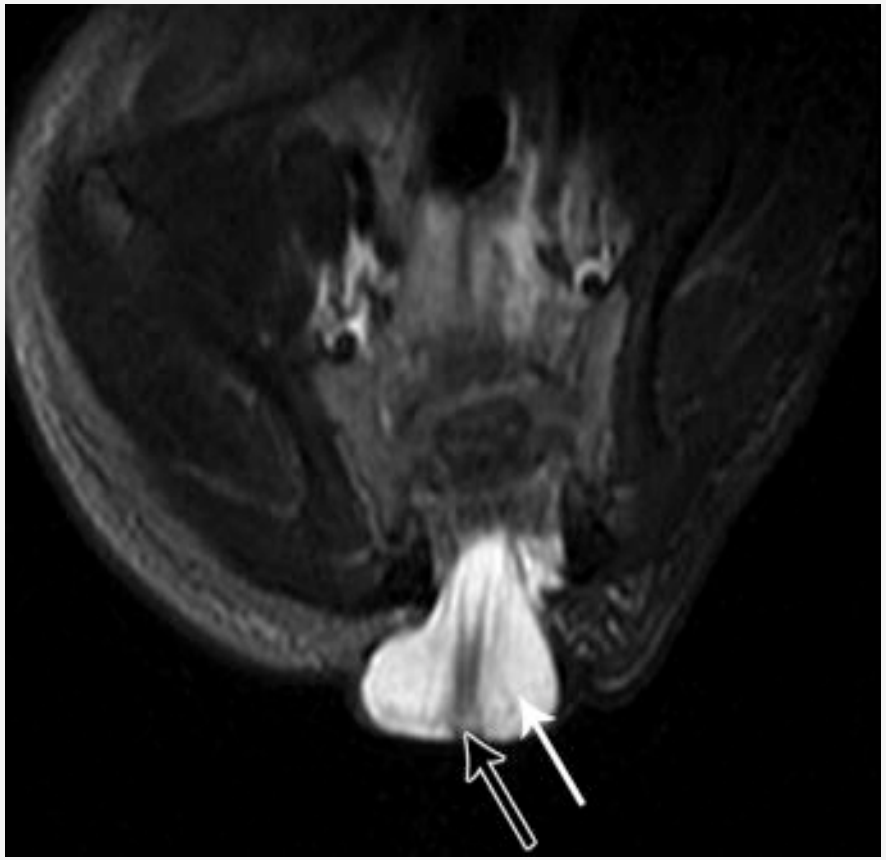
Myelocele

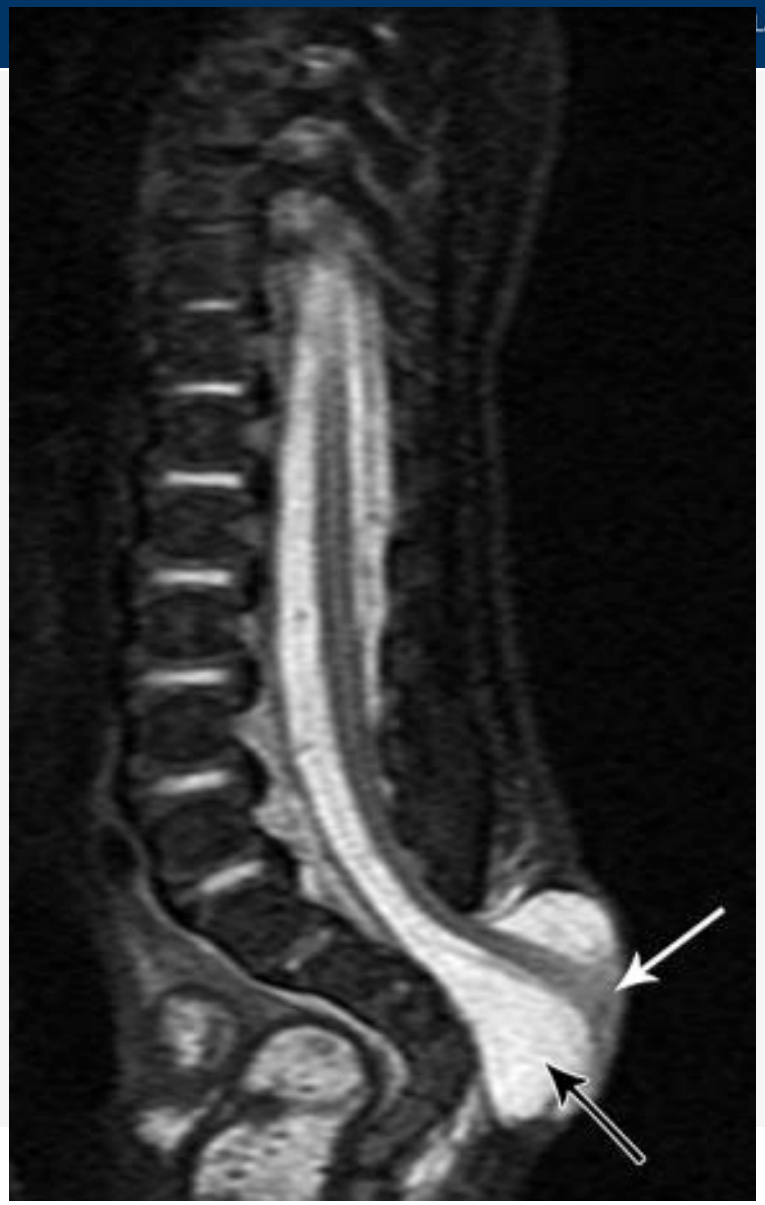




Myelomeningocele



neural placode



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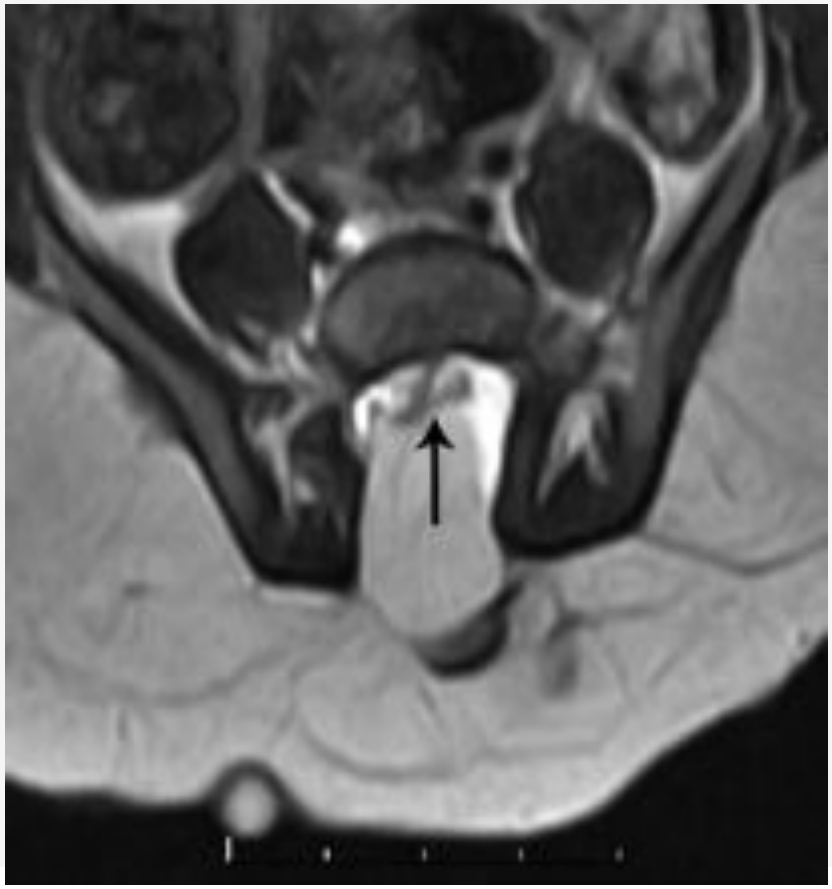
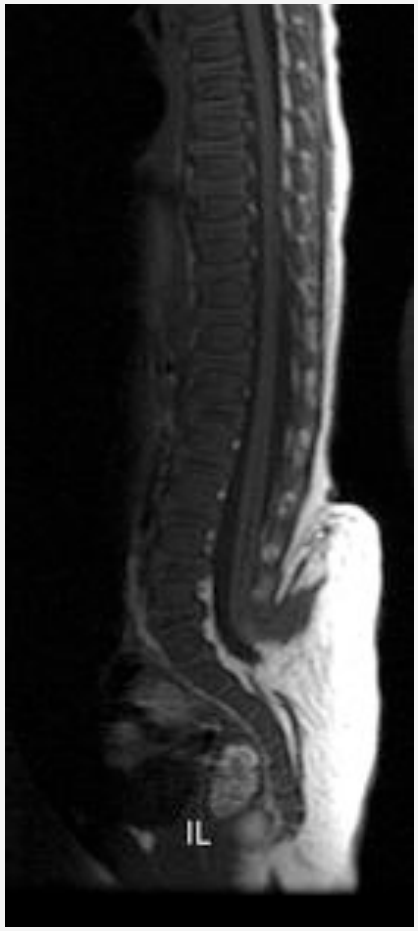
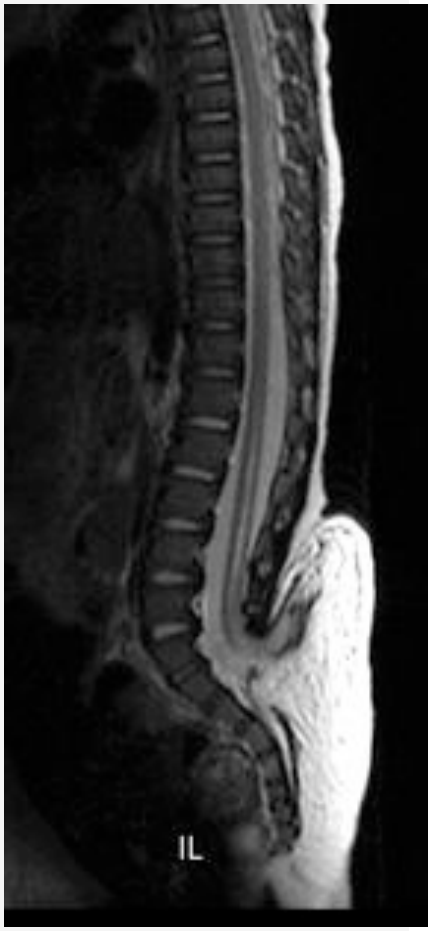
Lipomyeloceles







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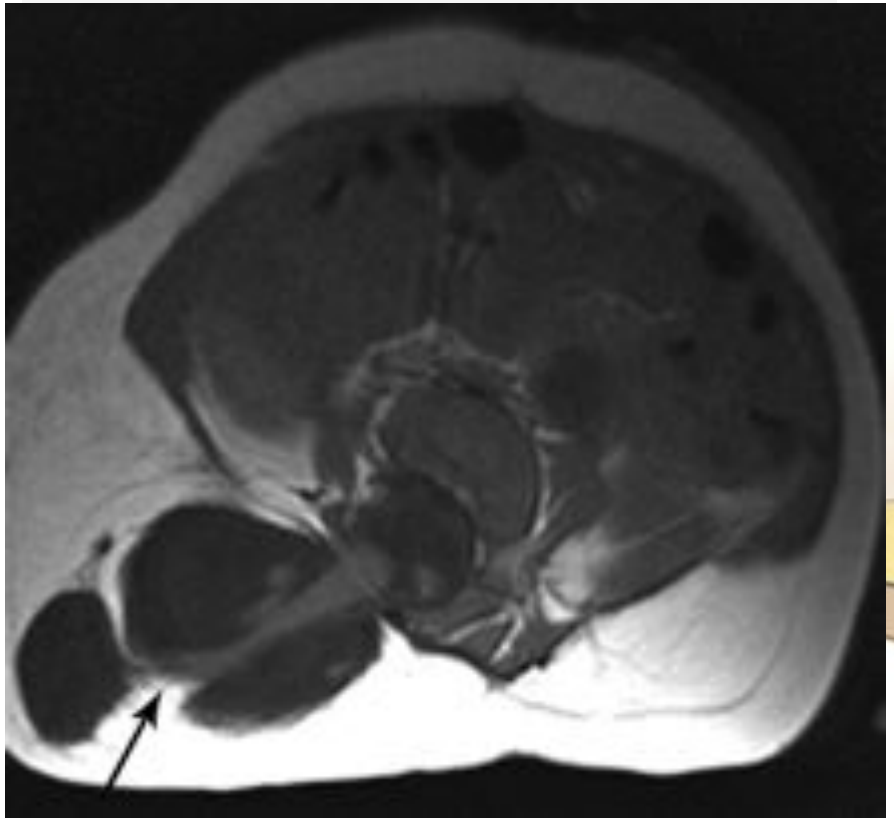
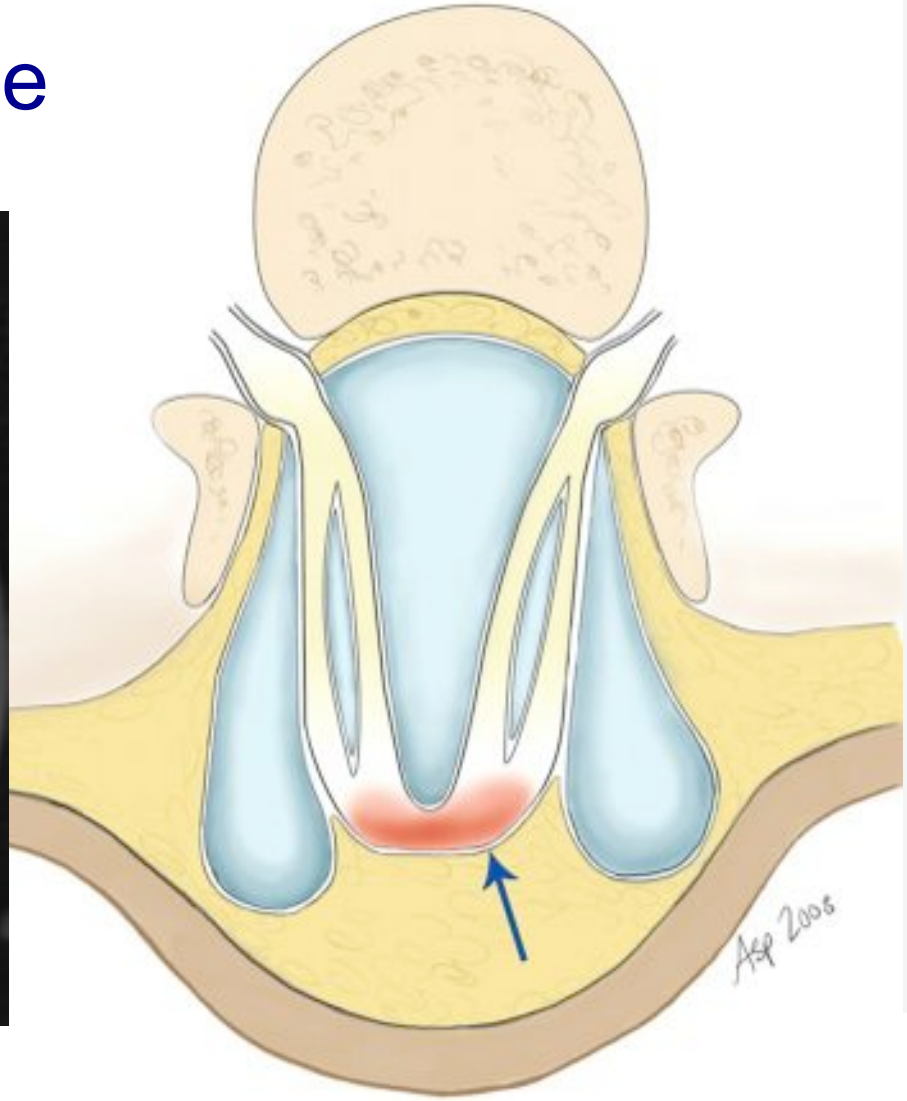
Lipomyelomeningocele





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Any questions?

Thank you