



# Spinal neoplasms

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**SDRC**

GLOBAL HOSPITALS

SL RAHEJA-FORTIS HOSP

# Task of a radiologist

- Compartmentalize an intraspinal lesion.
- Differentiate neoplastic lesion from demyelination, ischemia or vascular malformation.

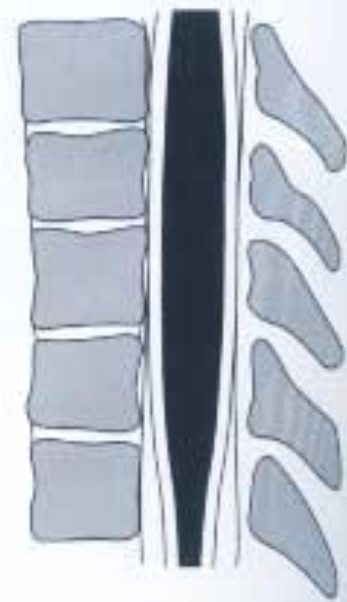
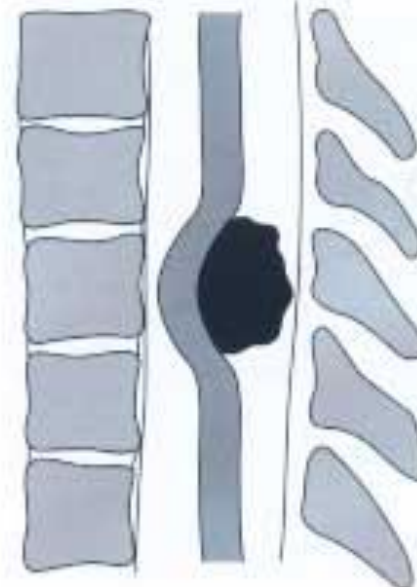
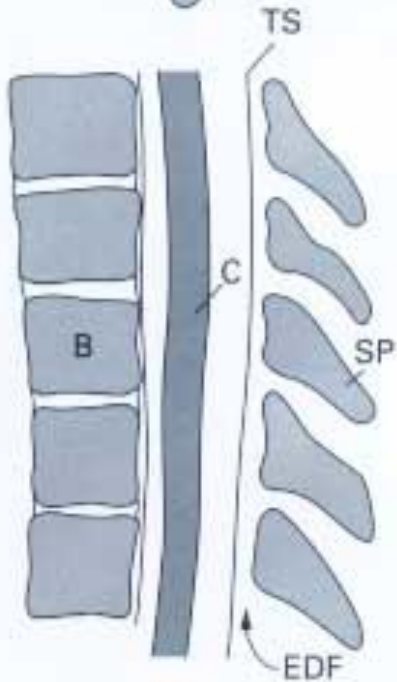
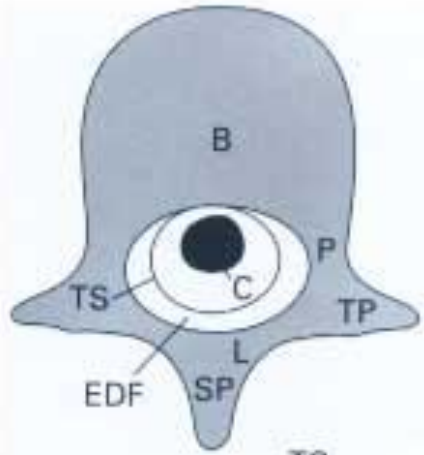
# Classification

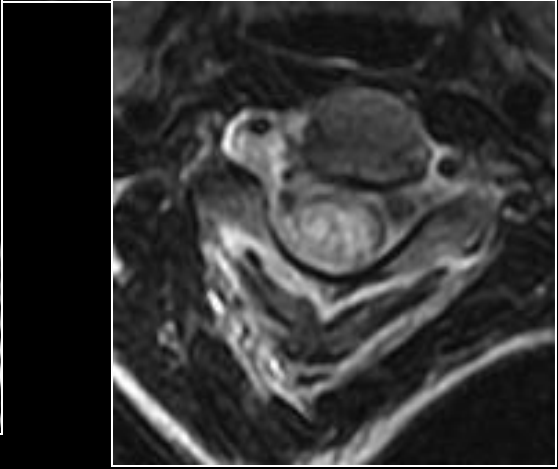
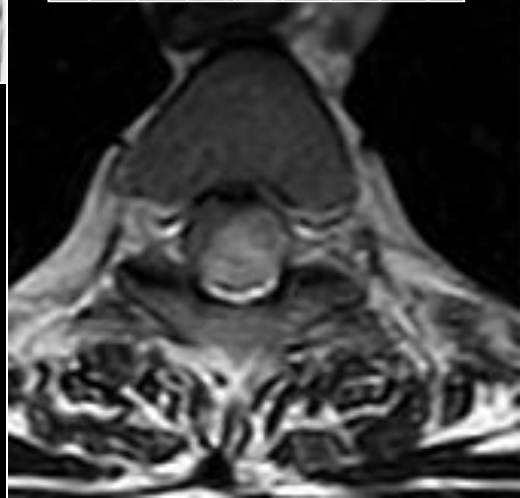
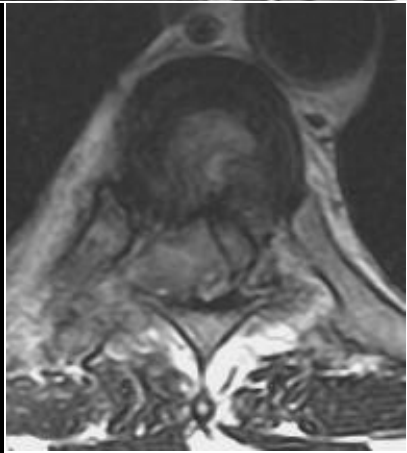
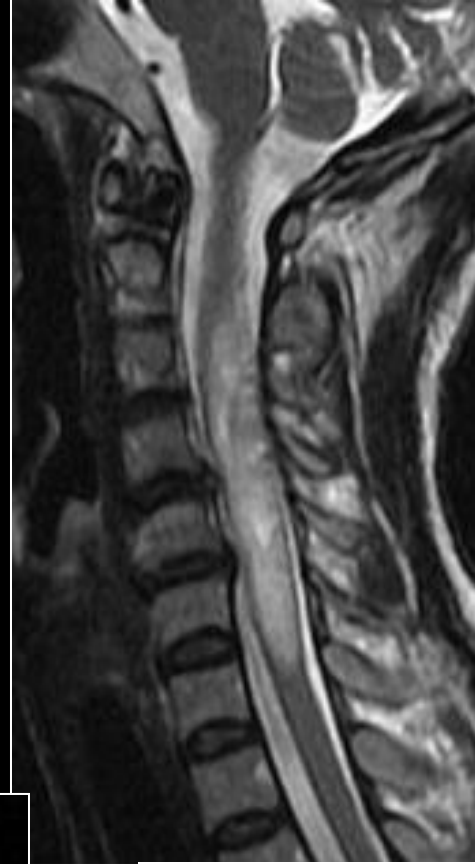
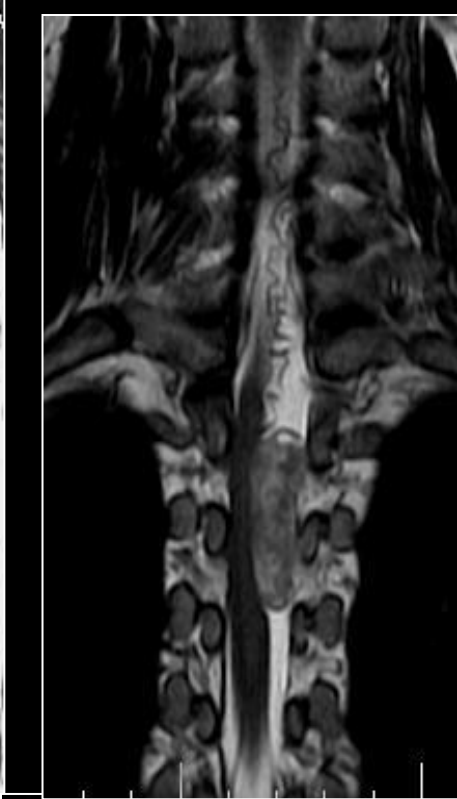
Intramedullary

Extramedullary

Intradural

extradural





# MRI technique

- Sag T1 & T2 weighted images
- Axial T1 & T2 weighted images
- Coronal T2 weighted images/ STIR
  
- IV Gadolinium
  
- CT SOS

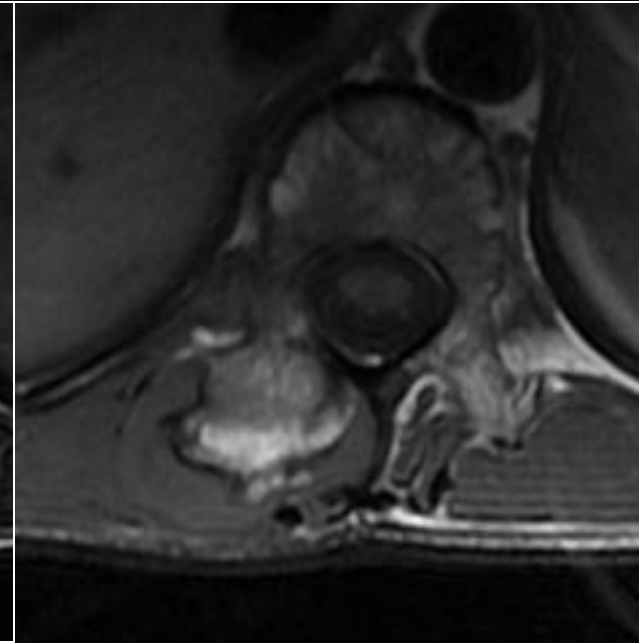
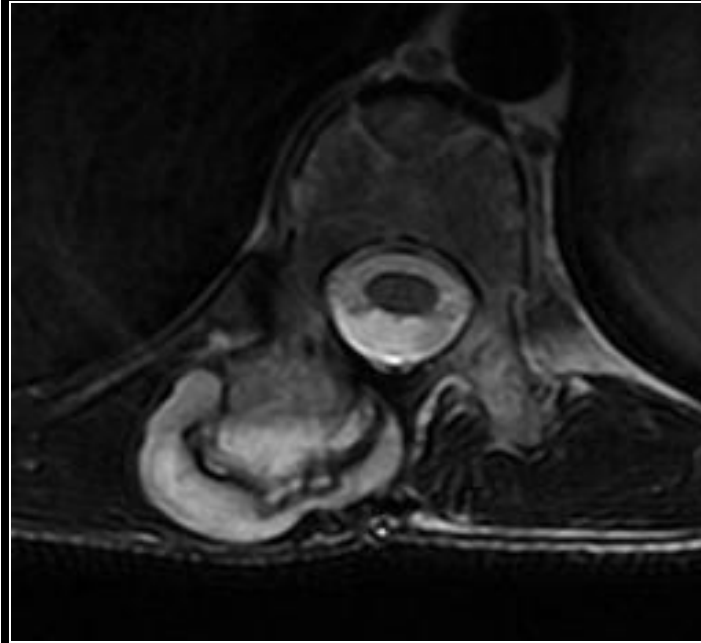
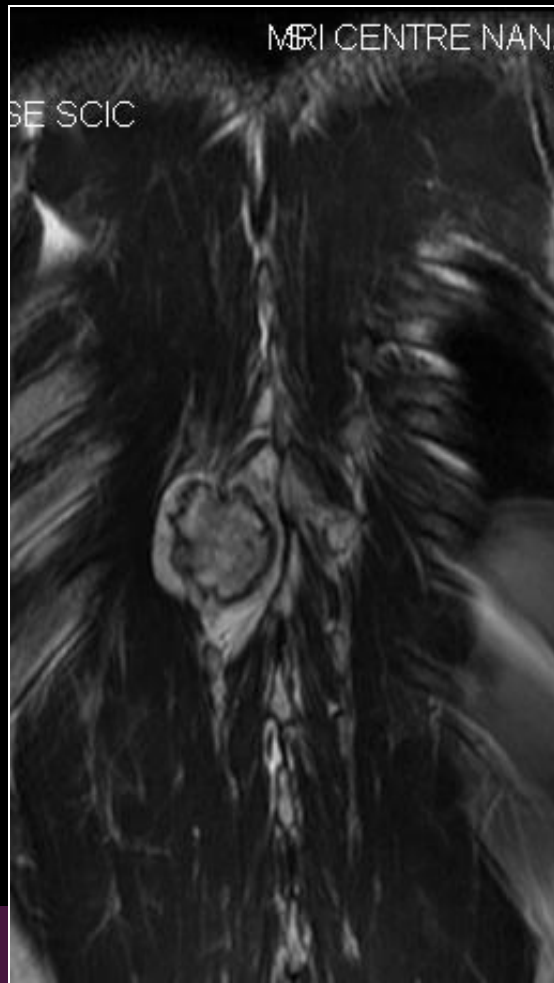
# Vertebral hemangioma

- Benign vascular tumors
- Majority discovered incidentally



# Osteochondroma

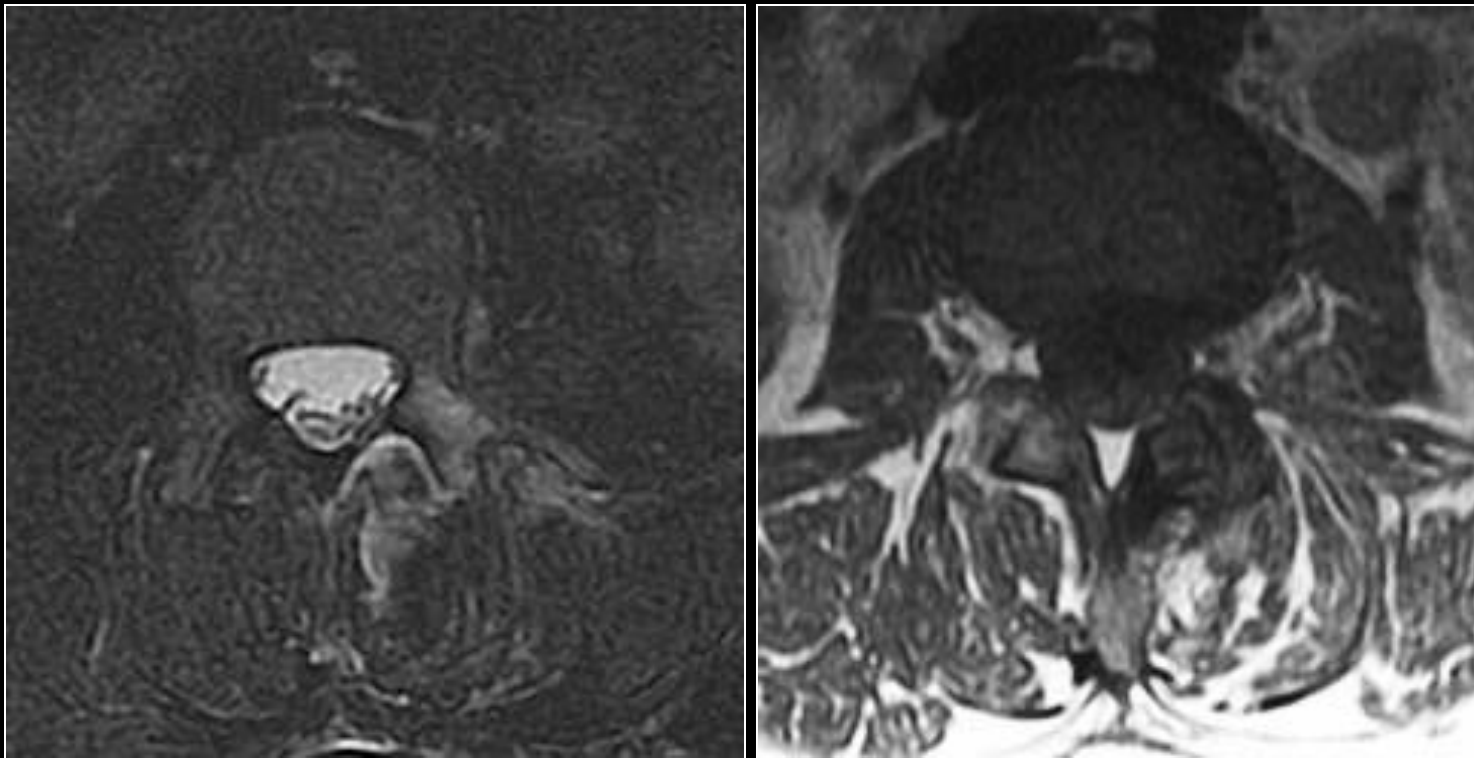
- Nearly always confined to post. elements
- T & LS spine





# Osteoid osteoma

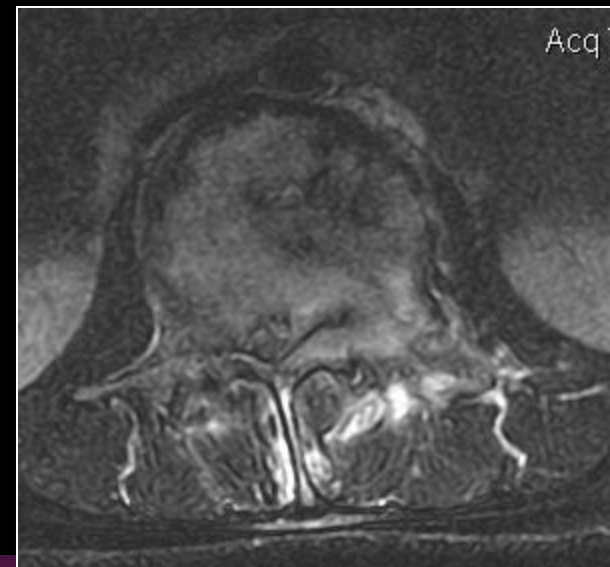
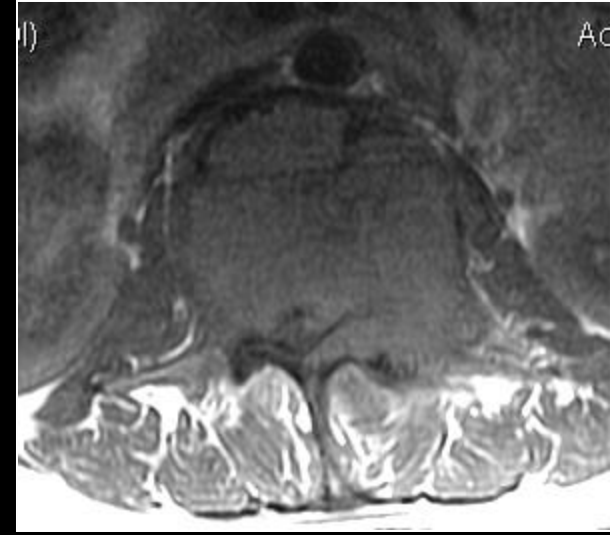
- Localized pain
- Post elements (75%)



Intense enhancement in vascular nidus

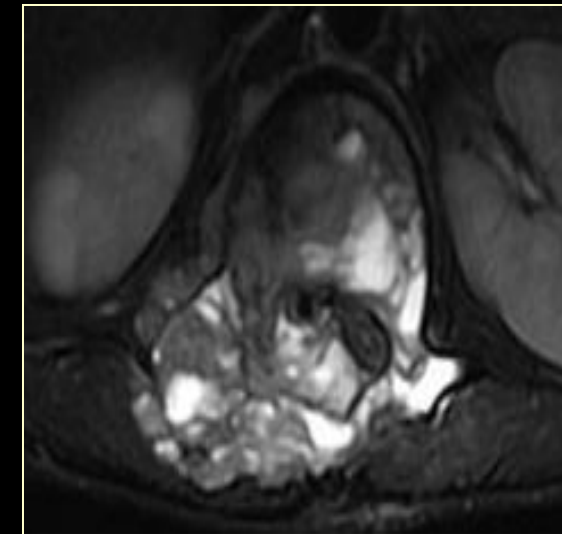
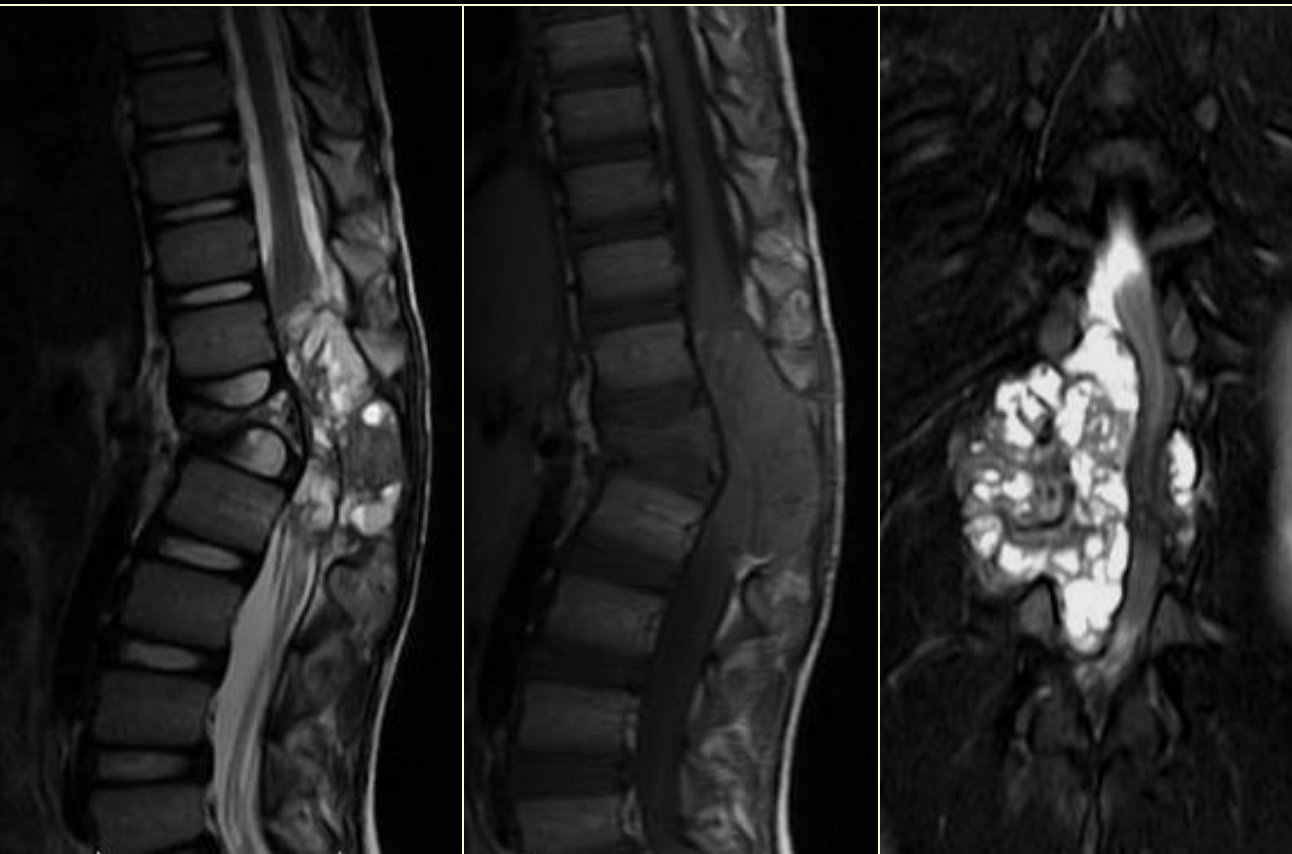
# Giant cell tumor / chordoma

- Adults
- heterogeneous



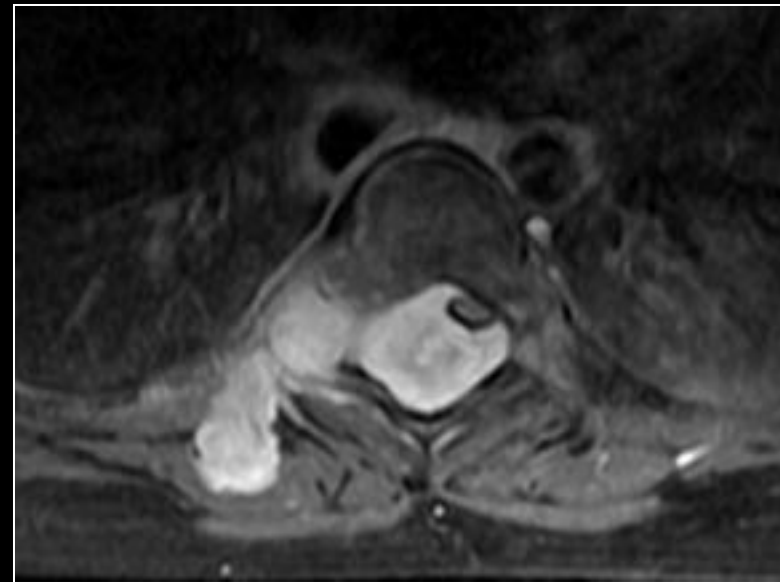
# Aneurysmal bone cyst

- Benign tumors of unknown etiology
- 10-25 yrs
- Post elements (60%)



Expansile lesion  
with septations,  
fluid-fluid levels

# Round cell tumor- Neuroblastoma



- Neural crest cells in paravertebral sympathetic chain
- < 5yrs

# Secondary extradural tumors

- 2<sup>nd</sup> most common location for metastases
- Breast, prostate, lung ca, lymphoma



# Metastases

# Osteoporotic #

- Convex post. Margin
- Post. Elements involved
- Assoc. Soft tissue

- Low-SI band spared normal bone marrow
- retropulsion of post. bone fragment
- Fluid sign



# Intradural extramedullary neoplasms

## Primary

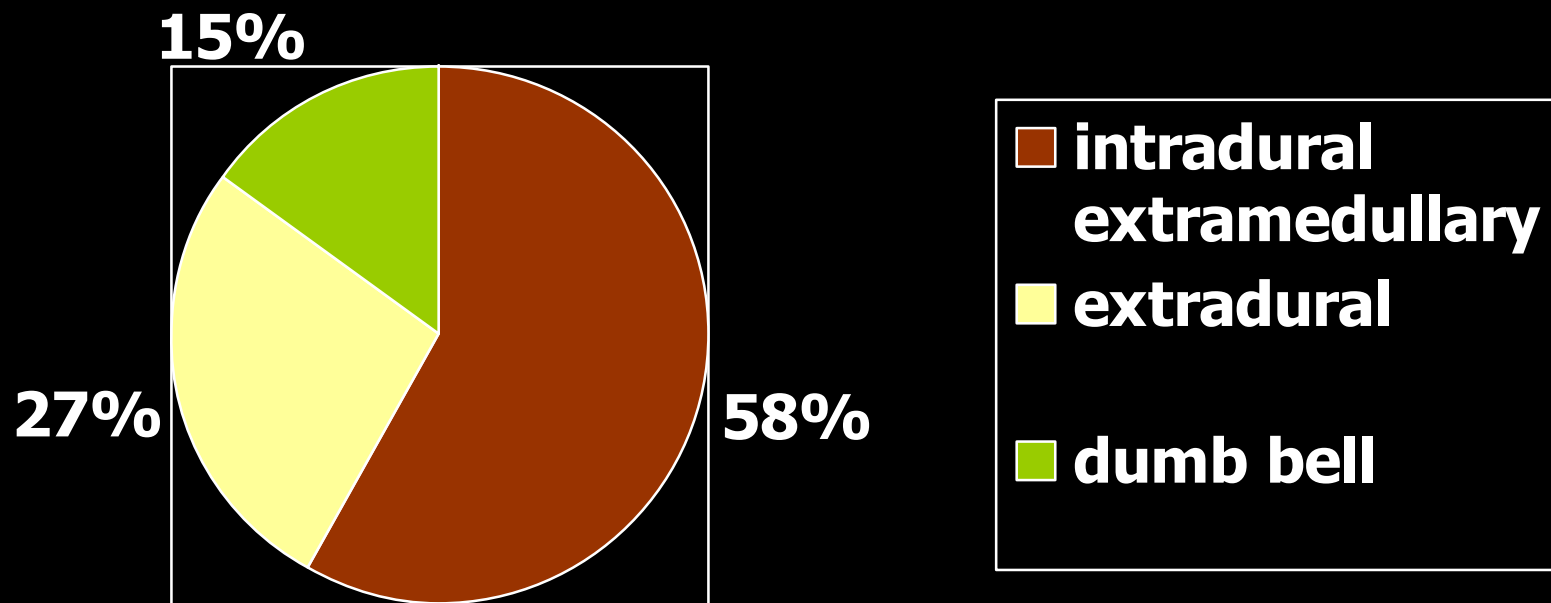
- Nerve Sheath tumor
- Meningioma

## Secondary

- Spinal leptomeningeal mets

# Nerve sheath tumors

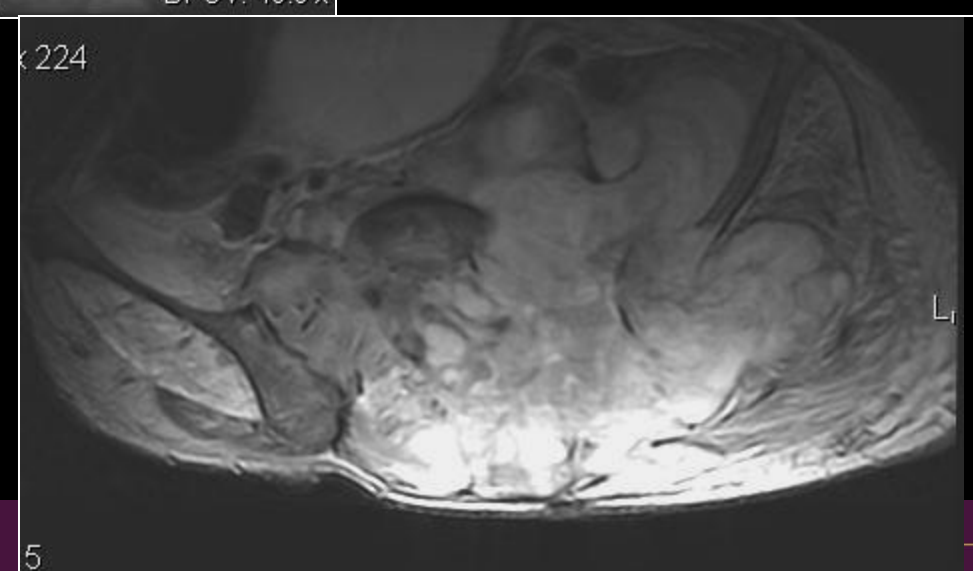
- Most common intraspinal lesion
- Schwannoma vs neurofibroma







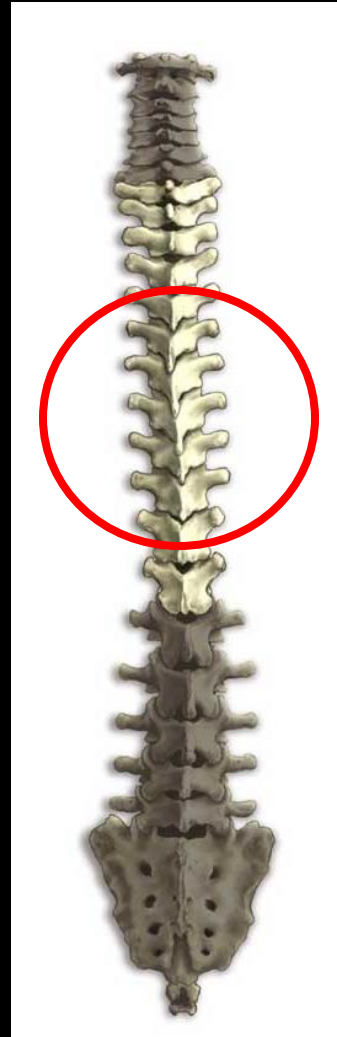
# Nerve sheath tumor



**Malignant degeneration**  
uncommon : 1 - 12 %

# Meningioma

- Adult females



# Meningioma



signal intensity similar to that of the gray matter of the cord on T2-weighted images

broad base of attachment to a dural surface

# Leptomeningeal metastases

Contrast enhanced MR  
sensitive

If tumor in spinal canal  
- spinal axis radiation  
essential





Focal nodular masses



Diffuse coating of cord



Homogenous ↑ in signal  
in SAS

# Classification of intramedullary neoplasms

## PRIMARY -

### GLIAL TUMORS

- Astrocytoma
- Ependymoma
- Subependymoma
- Ganglioma

### NON GLIAL TUMORS

- Hemangioblastoma
- Paraganglioma

### ROUND CELL

- Lymphoma
- PNET

- SECONDARY - Metastasis

# Intramedullary tumors

- cord expansion
- MR sensitive to hemorrhage ...so bleeding identified.
- Cysts common
- Majority show at least some enhancement
- absence of enhancement does not exclude an intramedullary neoplasm in presence of cord expansion



# Neurofibromatosis

- ependymomas in type 2 disease
  
- astrocytomas in type 1 disease

# Ependymoma

- most common intramedullary spinal neoplasm in adults
- Cellular Ependymoma
- Myxopapillary Ependymoma



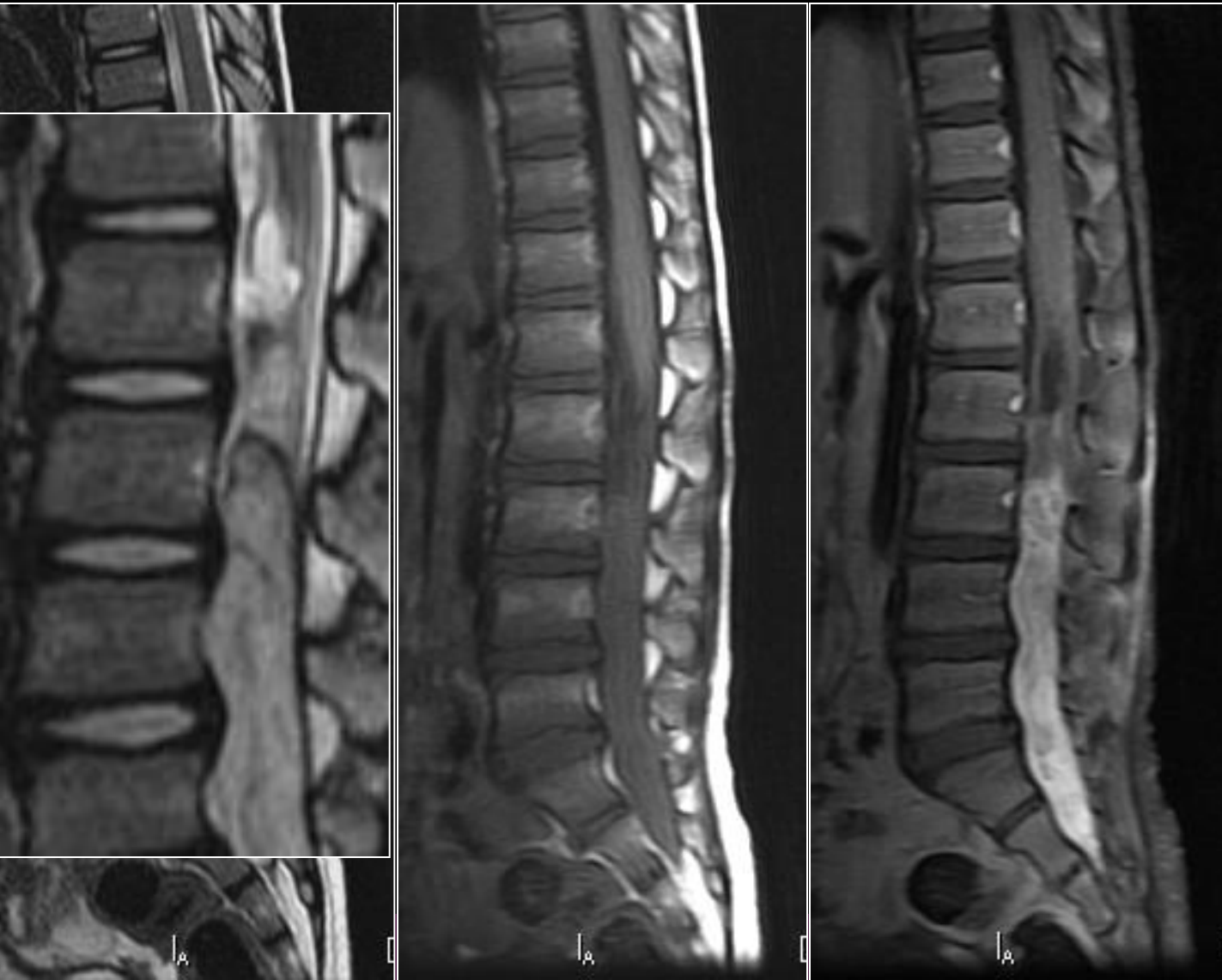
# Myxopapillary Ependymoma



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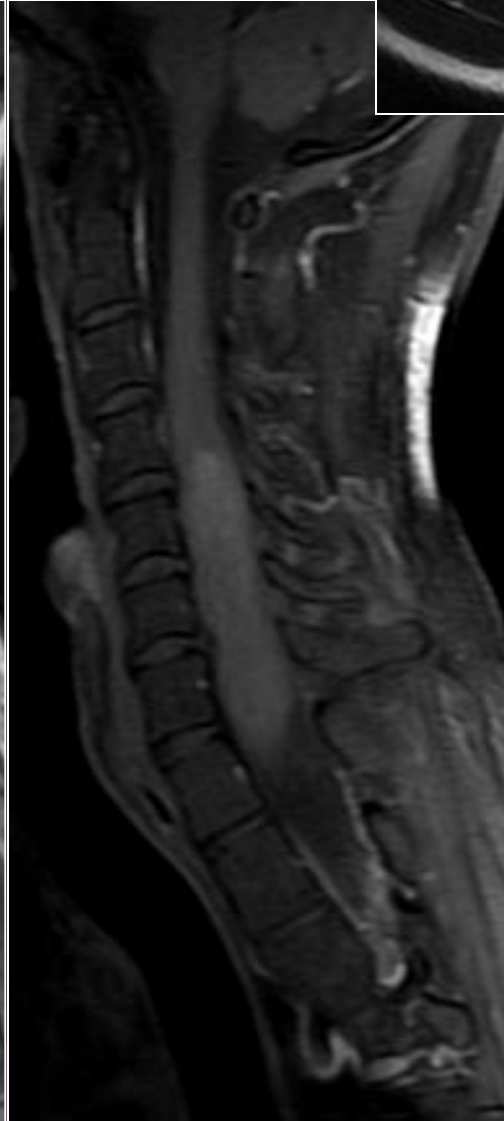
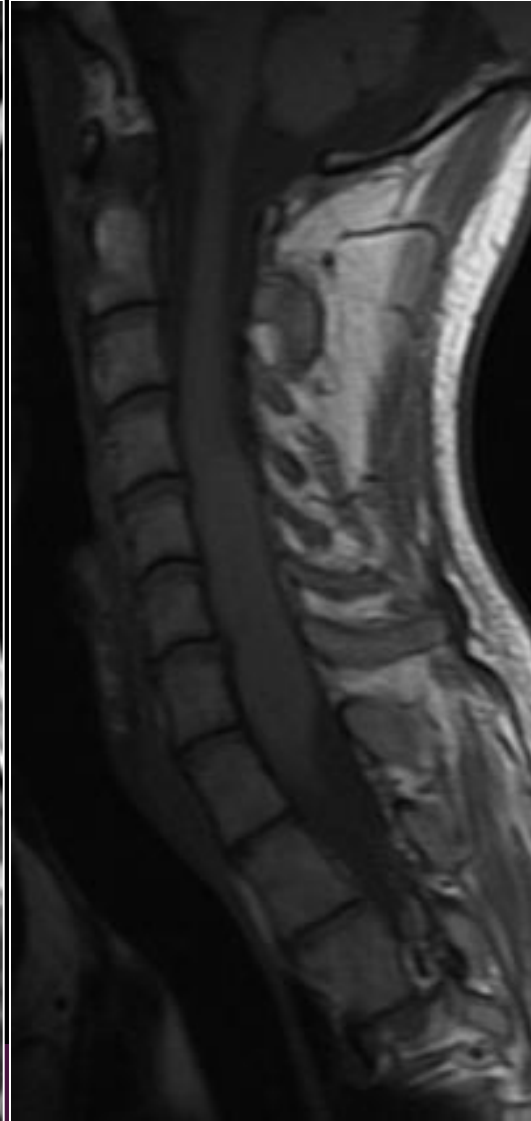
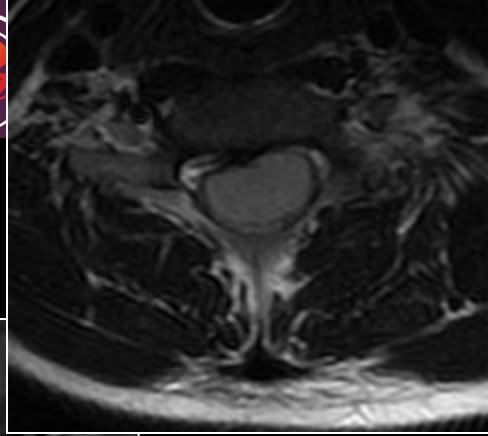


# Myxopapillary Ependymoma



"cap sign"

# Ependymoma



# Astrocytoma

- 3<sup>rd</sup> or 4<sup>th</sup> decade
- most common intramedullary tumor in children

Rare in the filum terminale



# Astrocytoma





# Astrocytoma - pilocytic



## Non tumoral cysts

- located at the **poles** of the solid portion of the tumor
- **no enhancement**



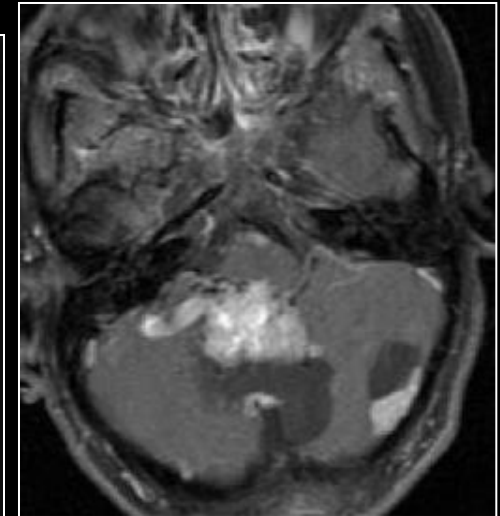
## Tumoral cysts

Contained within the tumor itself.

Show **peripheral enhancement**

- More in astrocytomas than ependymomas

# Hemangioblastoma



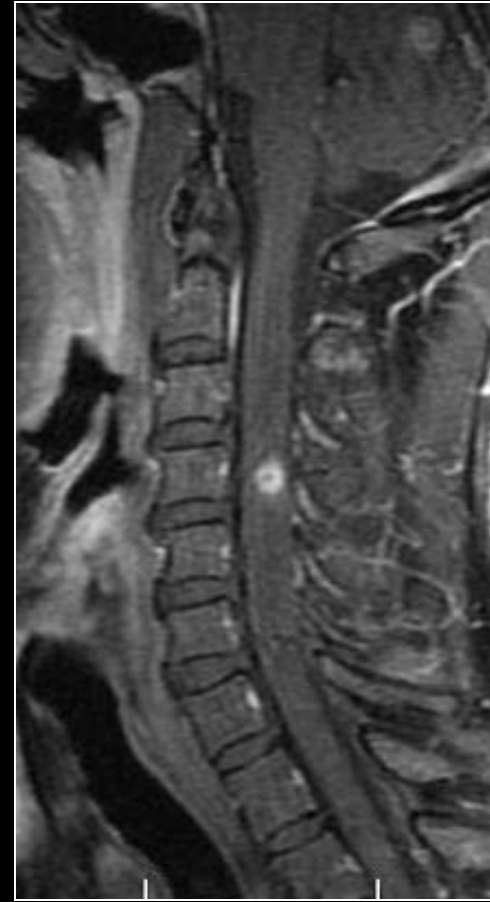
**Association-Von-Hippel Lindau Syndrome**  
{Cerebellar Hemangioblastomas, Retinal Angiomatosis, RCC & Pheochromocytoma}

# Metastases

- Breast & lung ca
- Routes :- Arterial  
Venous plexus (Batson's)  
Direct invasion (n.root / CS)

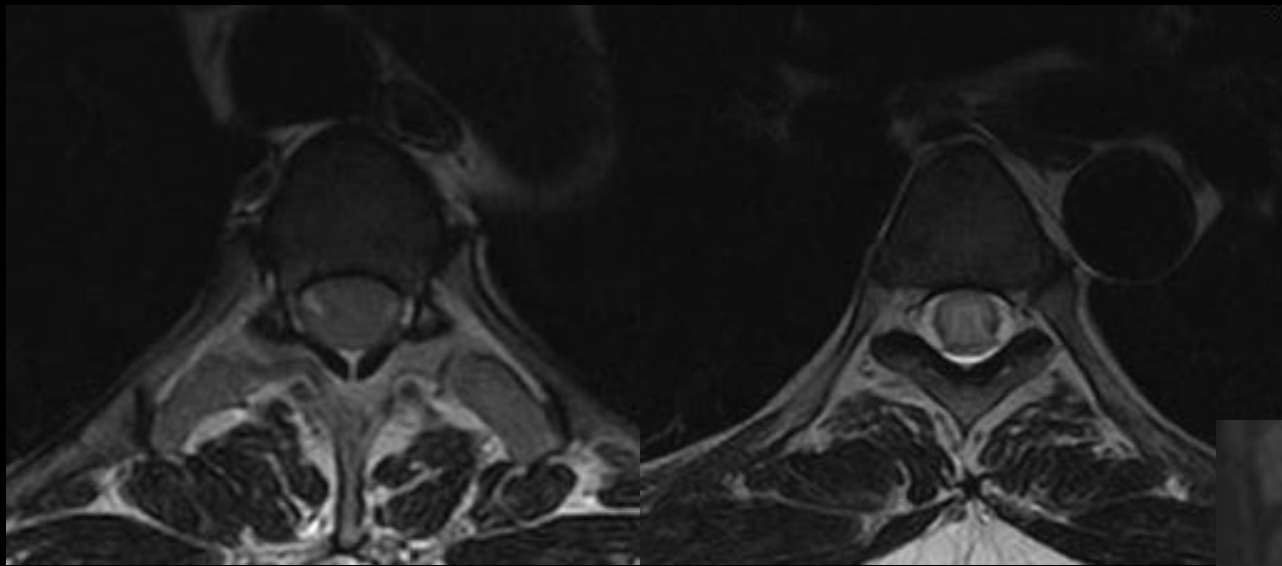


# Metastases



Edema disproportionate to size of lesion

# PNET



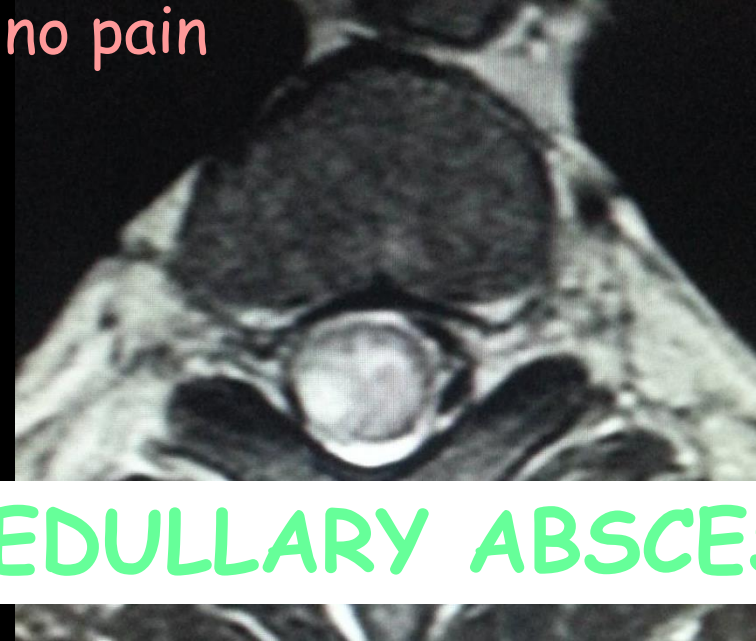
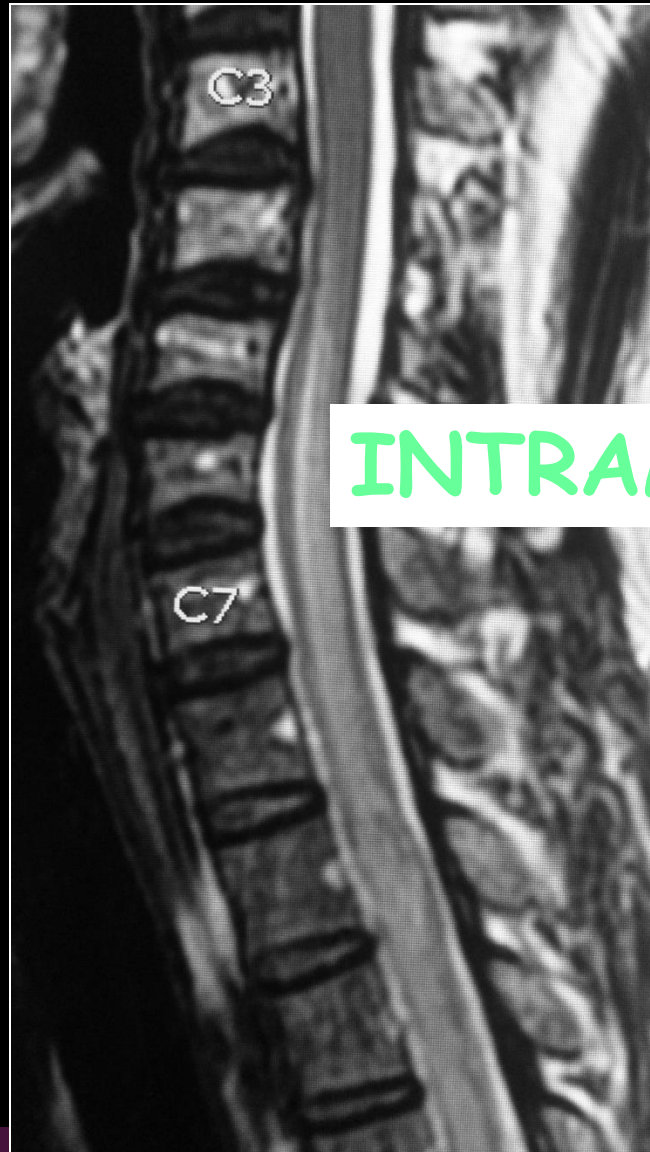
Well circumscribed  
Low T2 signal



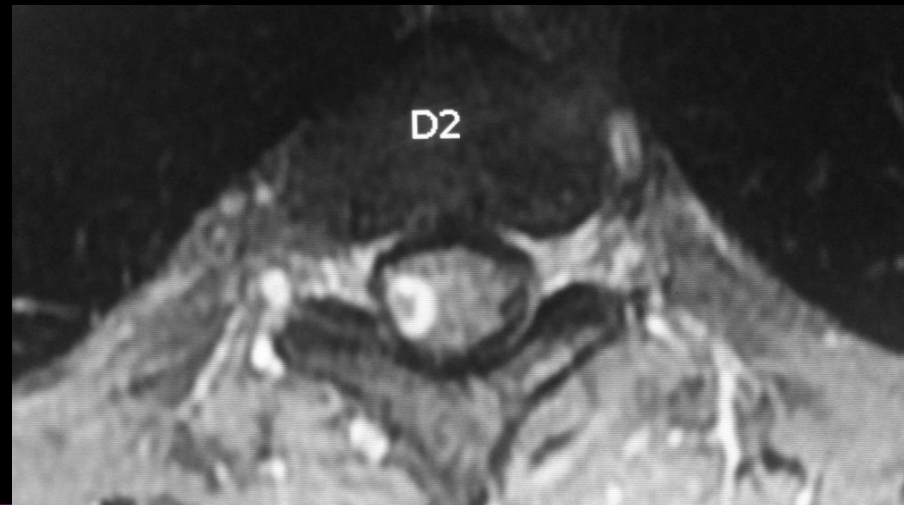


Dermoid with rupture

27 yr old male - right lower limb weakness  
since 1 week, no fever, no pain

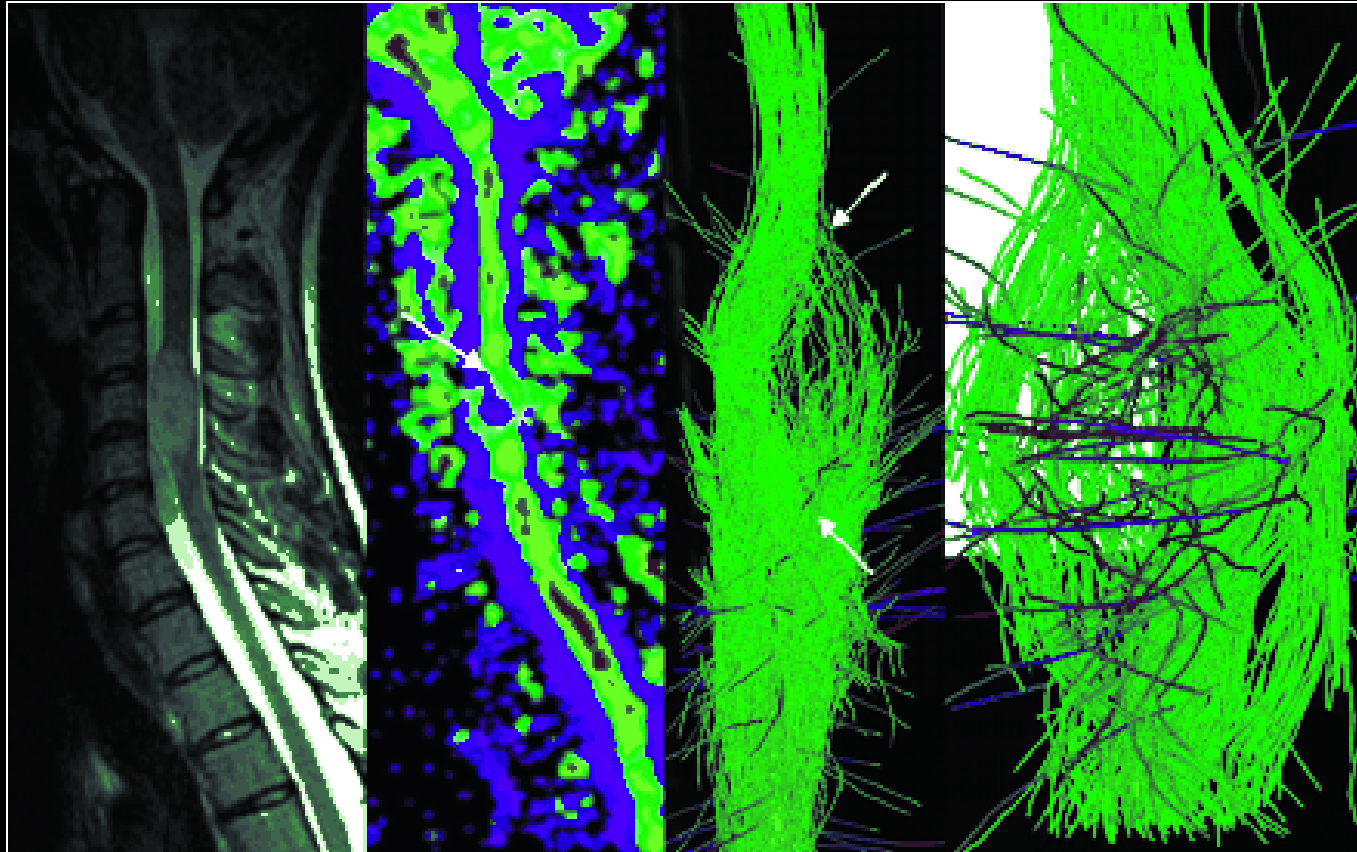


**INTRAMEDULLARY ABSCESS**





# What is new ?

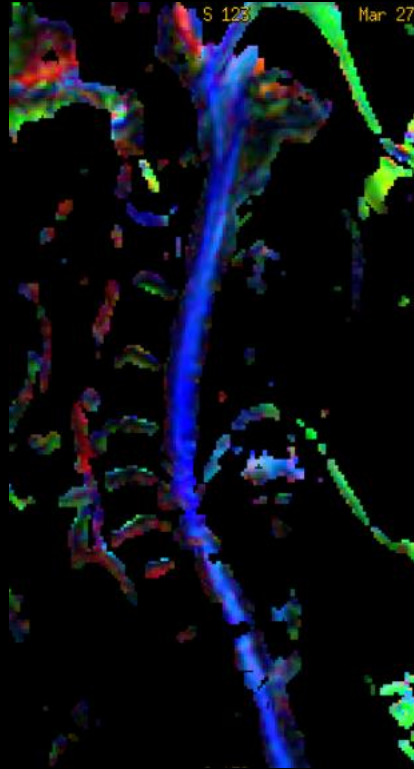


*American Journal of Neuroradiology 27:214-216, January 2006*

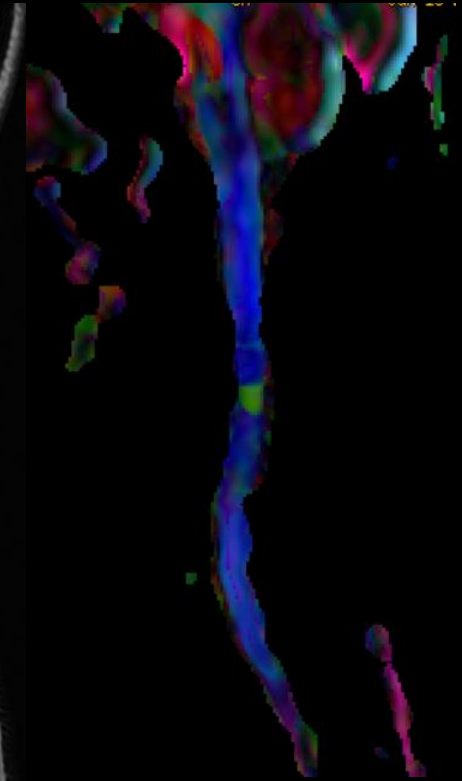
# CORD DTI



Edema



Myelomalacia



**MRI** is the preoperative study of choice to narrow the differential diagnosis & guide surgical resection.



*thank you*