

Diagnostic imaging (Tumors)

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Outline

- X-ray
- CT Scan
- MRI
- PET Scan
- Angiography

Findings of spinal tumors

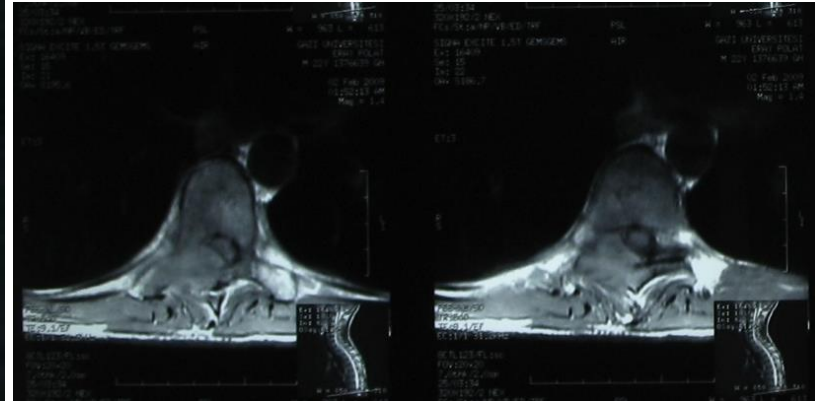
Imaging Modalities of Spinal Tumors

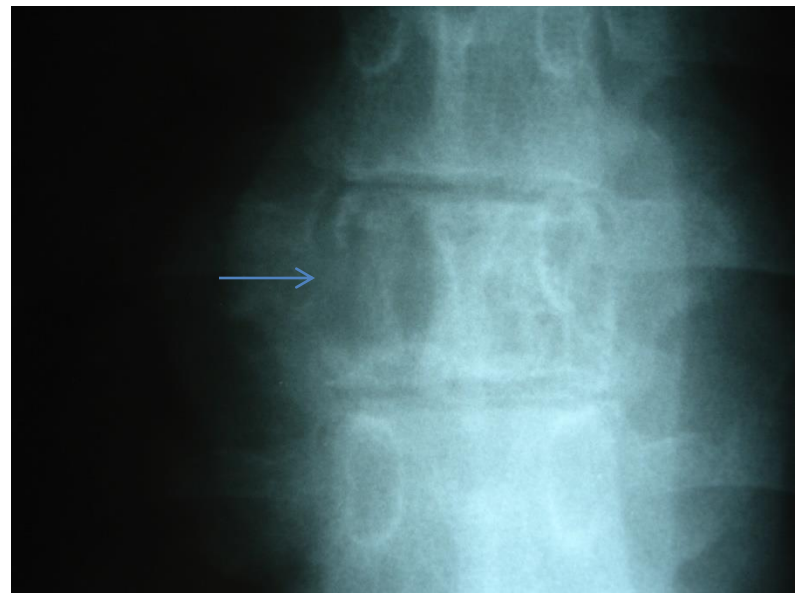
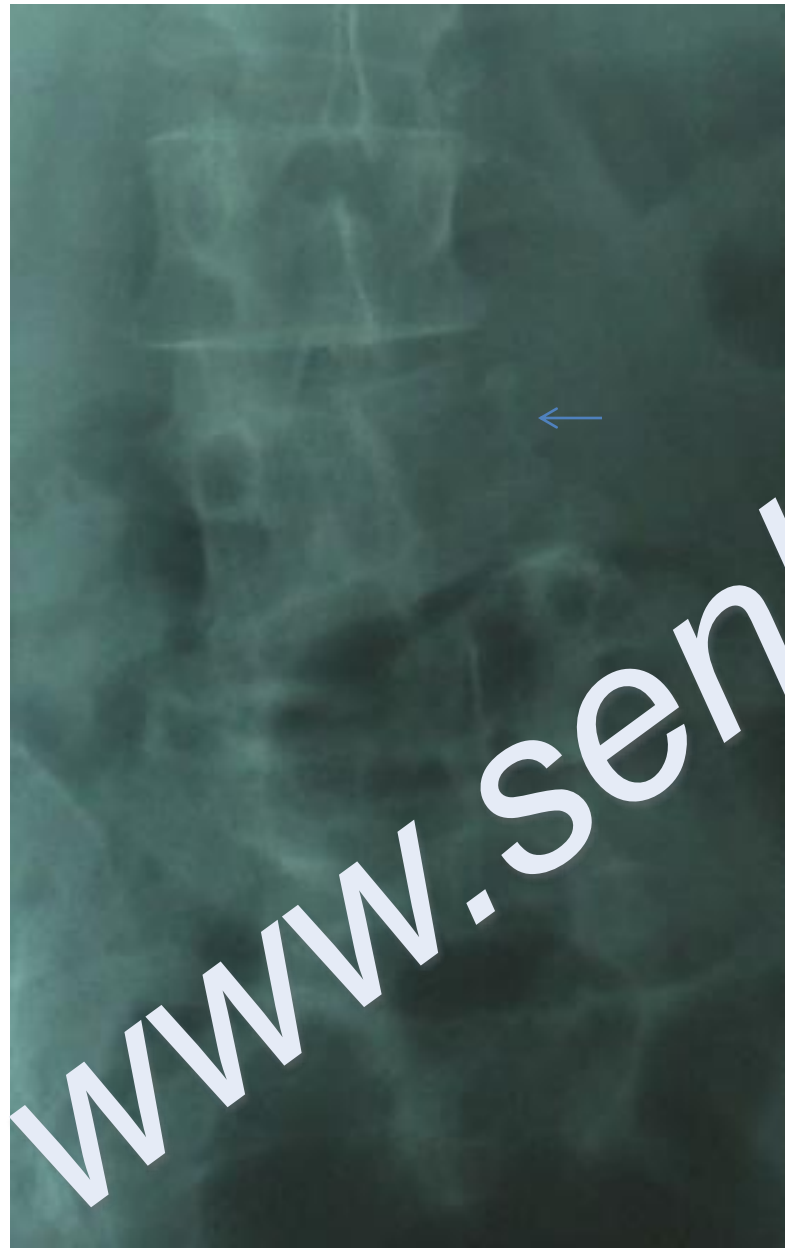
- Malign: Metastatic disease, Myeloma, Lymphoma
- Benign: Hemangioma

- X-ray
- CT Scan
- MRI
- Scintigraphy
- Angiography

Xray:

- Lytic cancellous lesions need 30-50 % destruction for xray imaging
- Important for the evaluation of instability and deformity
- Lytic cortical lesions can be detected earlier
- Disc space generally protected in tumors
- “Winking owl” sign for asymmetric pedicular involvement





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Metastatic Lesions

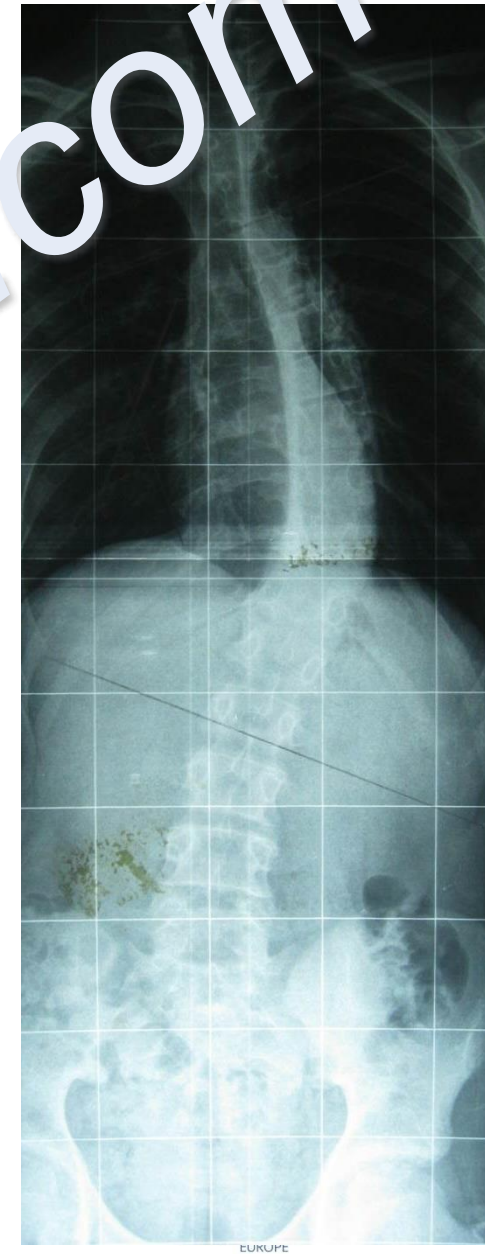
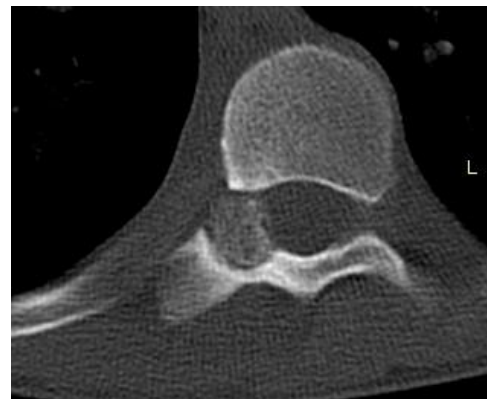
- Lytic
 - Lung
 - Kidney
 - Breast
 - Melanoma
- Blastic
 - Prostate
 - Bladder
 - Stomach
- Mixed
 - Breast
 - Lung
 - GI



CT Scan

Allows visualization of

- Detailed bony anatomy (useful for surgical planning)
- Extent of soft tissue mass
- Extent and direction of spinal cord impingement by bone debris
- Special lesions (osteoid osteoma, osteoblastoma..)



MRI

Superior in evaluating

- Soft tissue mass
- Neural elements
- Multilevel involvement

Findings:

Hipointense T1, Hyperintense T2, Gd-DTPA enhanced T1



Benign Lesions

- Geographic bone destruction
- Sclerotic margins
- No soft tissue extension

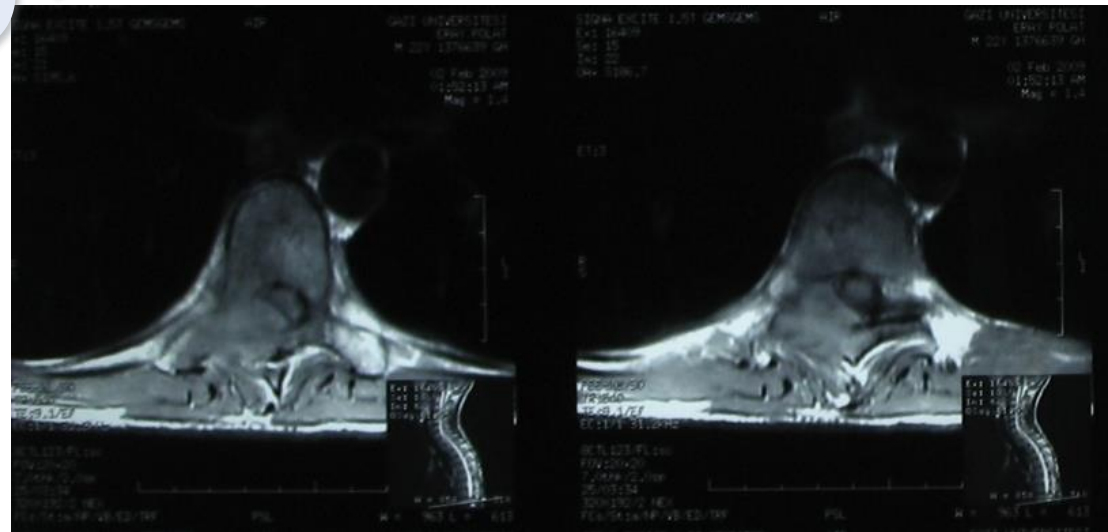
Except;

Aggressive hemangioma

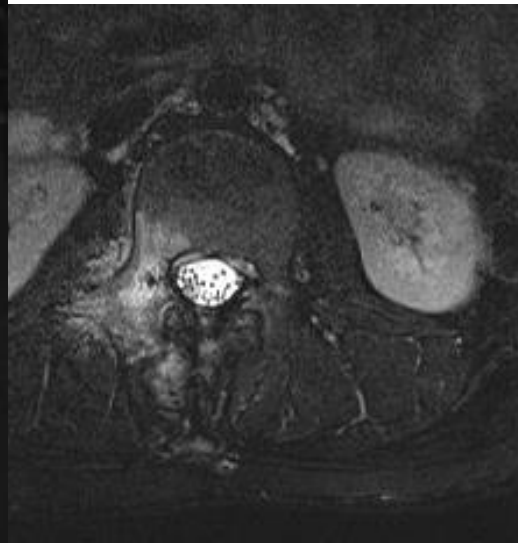
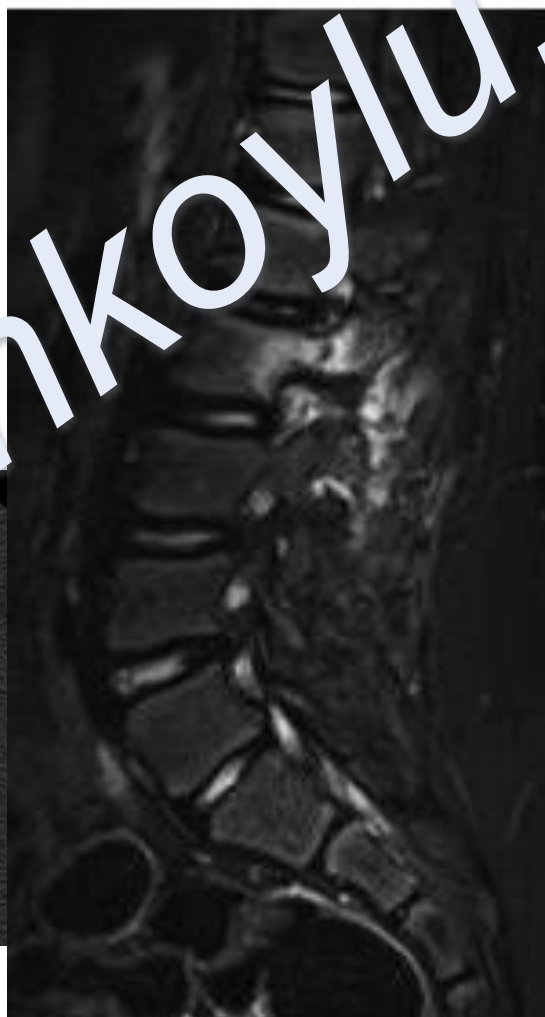
Eosinophilic granuloma

ABC

Giant-cell tumor



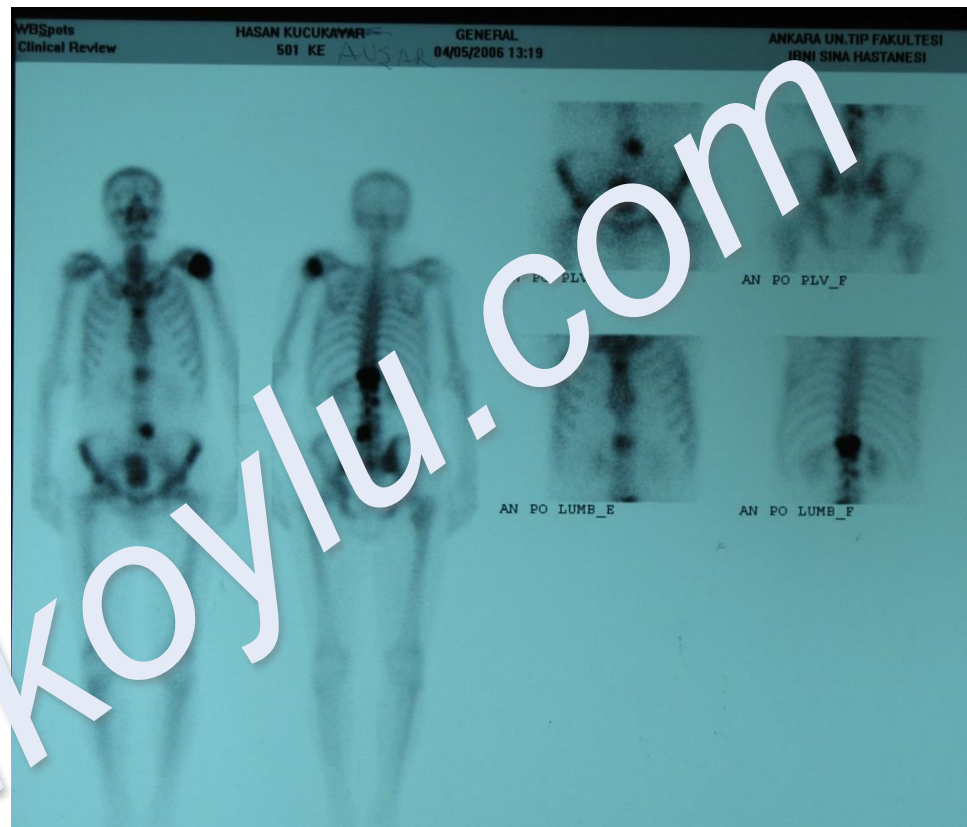
11 yo, M



Scintigraphy

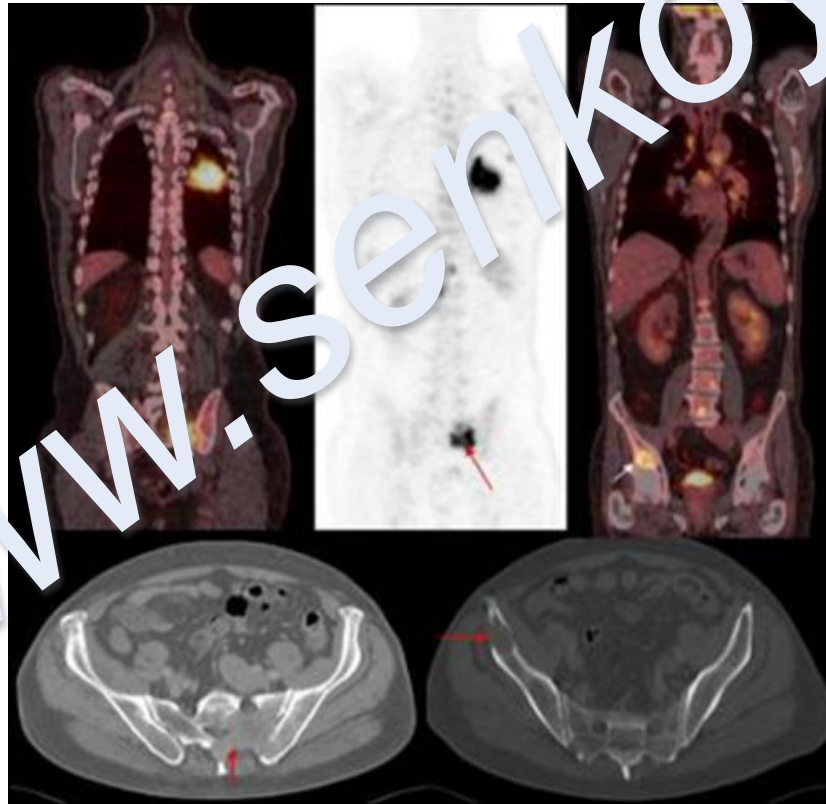
- High Sensitivity
- Low specificity
 - False Positive:
 - Degenerative conditions
 - Trauma
 - Metabolic bone disease
 - False Negative:
 - Plasmocytoma
 - Myeloma

Useful for the staging!!



PET Scan

- Important for staging
- Differentiate osteoporotic fracture from pathologic fracture
 - SUV less than 3: osteoporotic



Angiography

- CT or MR angiogram for relationship bw tumor and spinal vessels
- But angiography remains gold standard
- Some vascular tumors may require preoperative embolization: ABC, Medullary thyroid CA, giant cell tumor, hemangioma




Multiple?
-metastasis
-myeloma
-lymphoma
-enostosis
-hemangioma
-eosinophilic granuloma

Involvement of adjacent vertebral levels?
-osteosarcoma
-chondrosarcoma
-myeloma, † plasmocytoma †
-lymphoma
-Ewing sarcoma
-chordoma
-ABC †
-giant cell tumor †

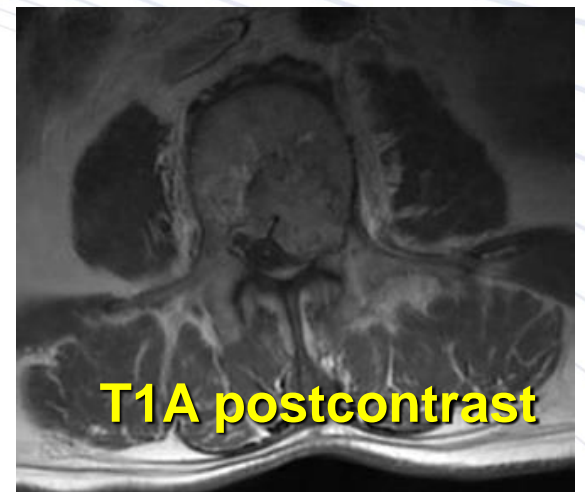
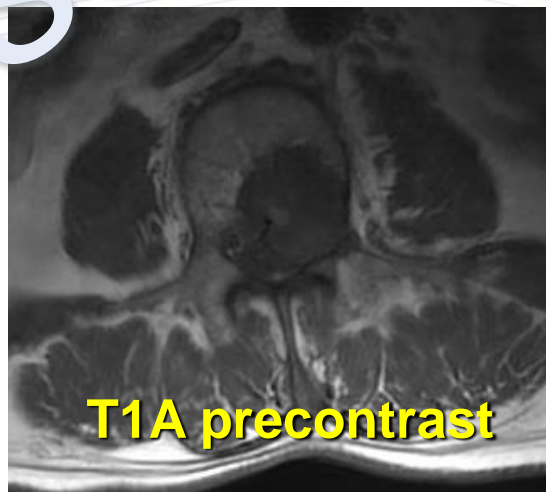
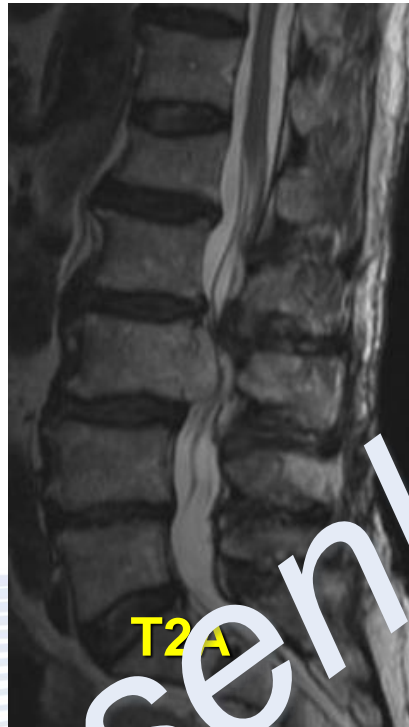
† may extend through the intervertebral disk

Common distribution of tumors of the spine

Location in vertebra?

<p>Malignant -metastasis -myeloma ‡ -plasmocytoma ‡ -lymphoma -chordoma</p> <p>Exceptions -hemangioma -eosinophilic granuloma -giant cell tumor ‡ ‡ common extension in the neural arch</p>		<p>Benign -osteoid osteoma -osteoblastoma # -osteochondroma -ABC #</p> <p>Exceptions (sarcomas) -chondrosarcoma # -osteosarcoma # -Ewing sarcoma # # common extension in the vertebral body</p>
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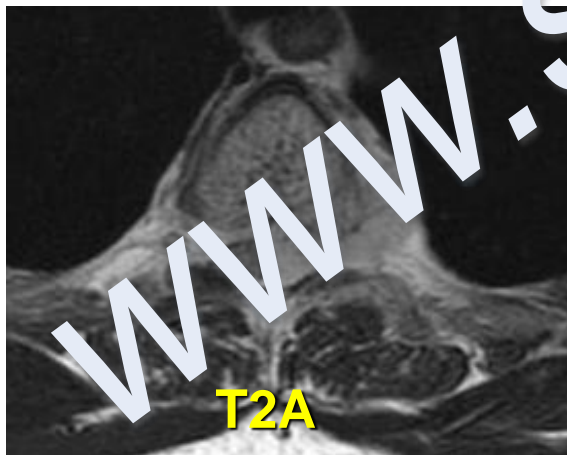
49 yo, M Chordoma



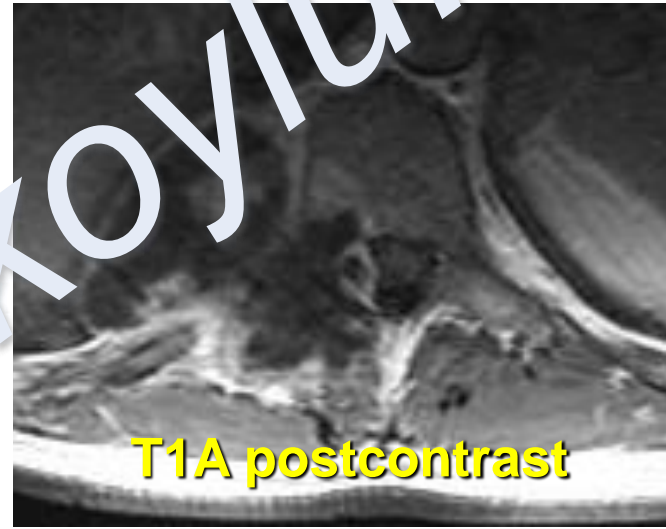
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55yo, F

Atypic Hemangioma



41 yo F, Chondrosarkoma



Thank you

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