# AMSER Rad Path Case of the Month March 2019

## 71-year-old male with neck pain


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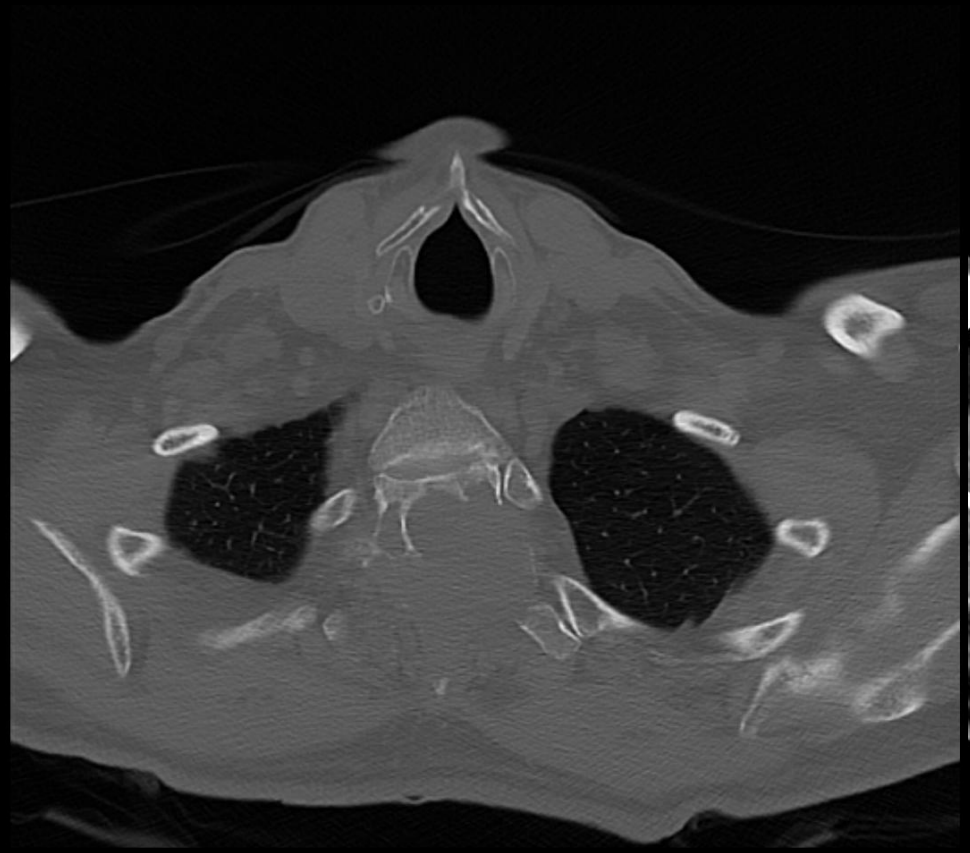
# Patient Presentation

- 71M presents to the ED with a 6-week history of neck pain, initially treated conservatively with acetaminophen.
- Pain has worsened for past week, now “sharp” with associated left arm “tingling” and “cold” sensation in left hand.
- PMH: Smoldering myeloma since 2009 (on observation, no treatment). Bone spurs at C6-C7 spine.
- Physical Exam: Notable for tenderness to palpation adjacent to T2-T3 spine. Neurologic exam unremarkable.

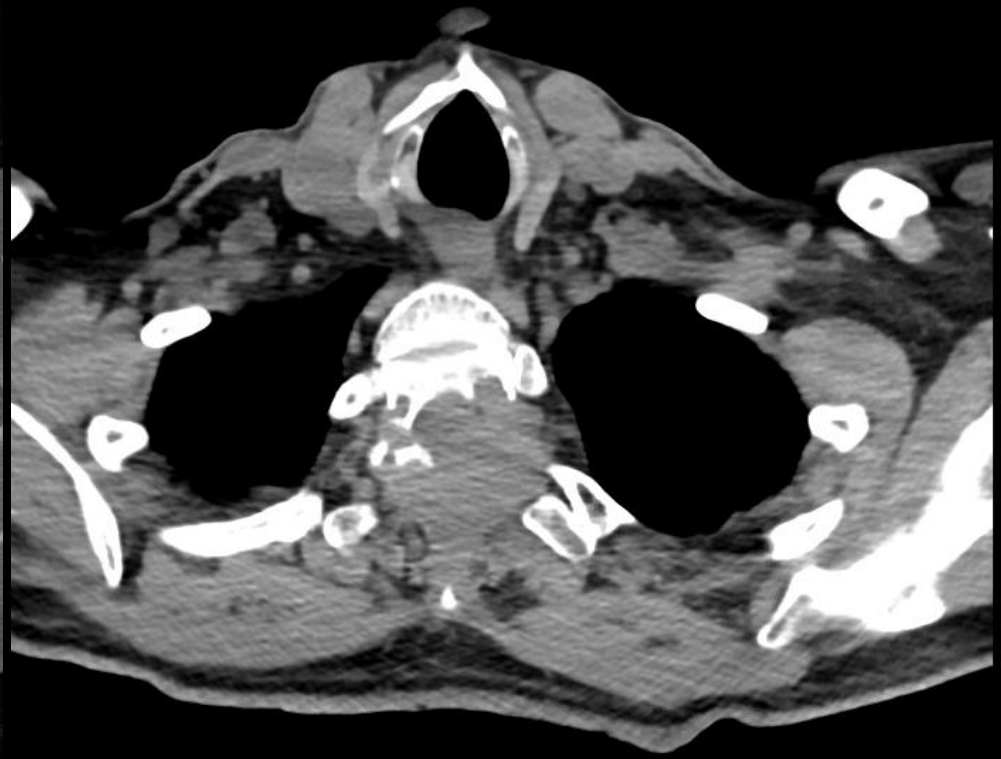
# Labs

- CBC, BMP, and UA were unremarkable.

# CT Spine Without Contrast

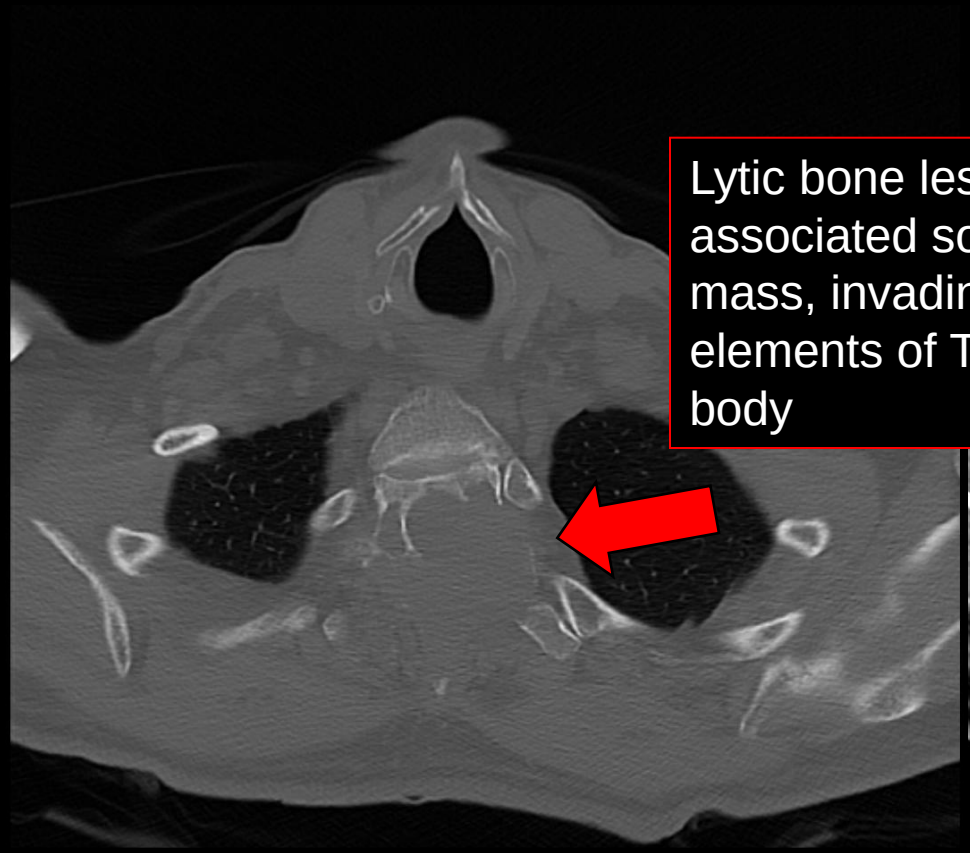


Bone Window

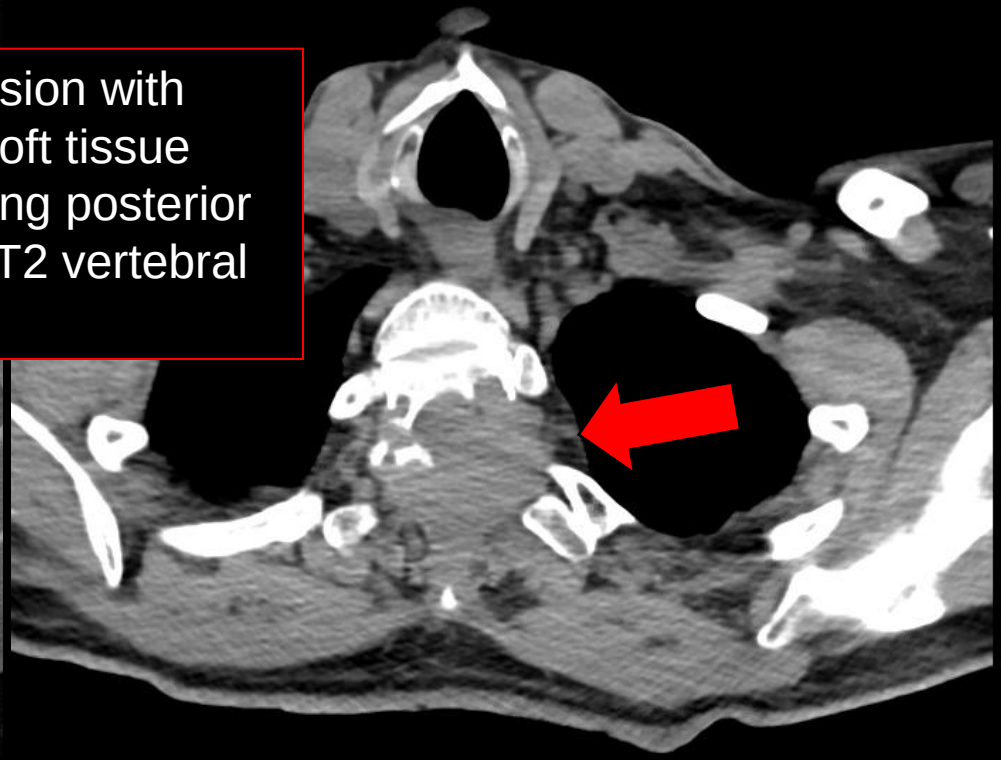


Soft Tissue Window

# CT Spine Without Contrast



Lytic bone lesion with associated soft tissue mass, invading posterior elements of T2 vertebral body



Bone Window

Soft Tissue Window

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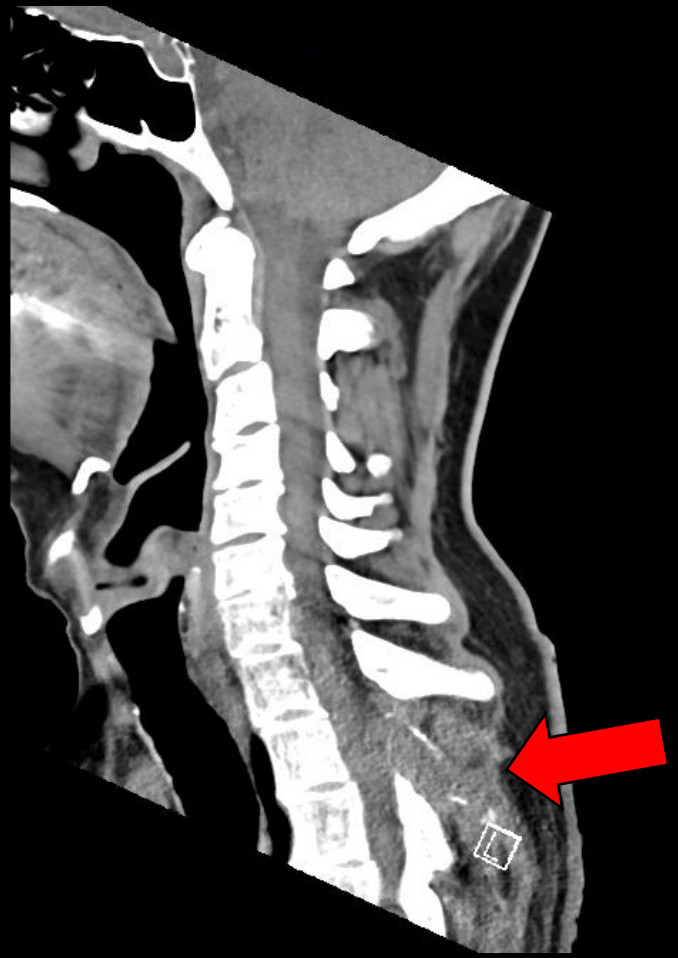
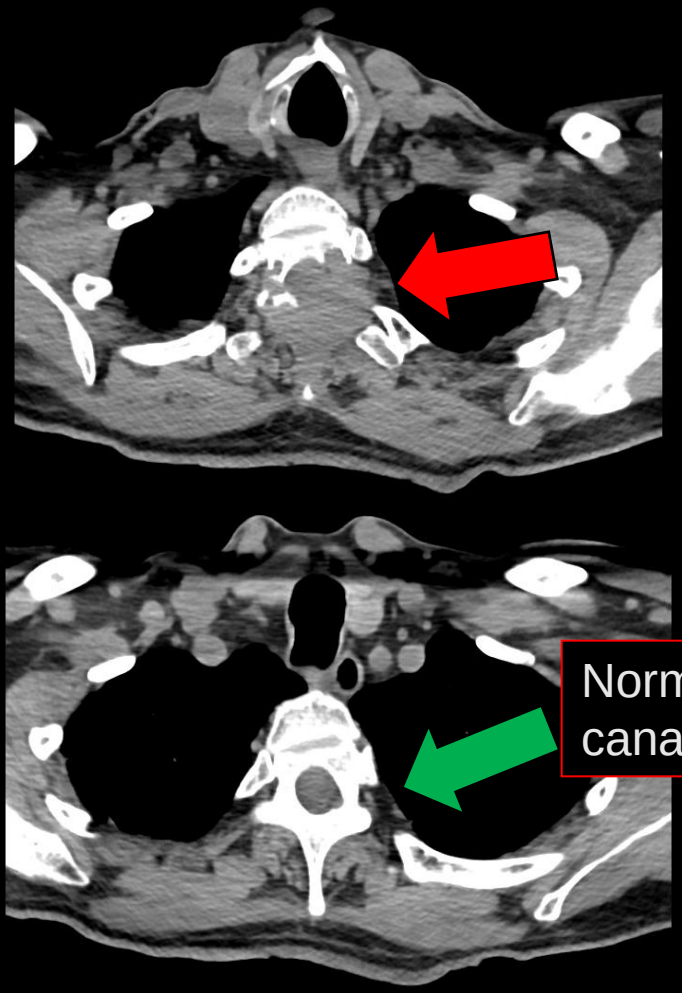
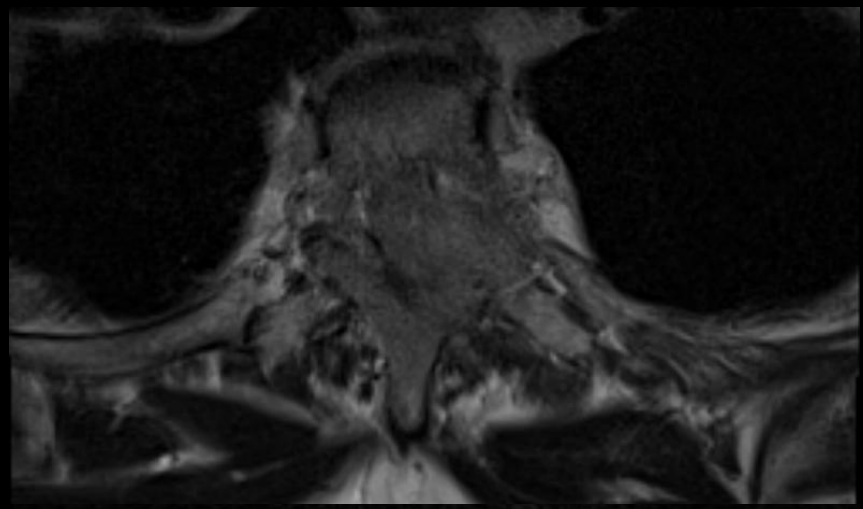
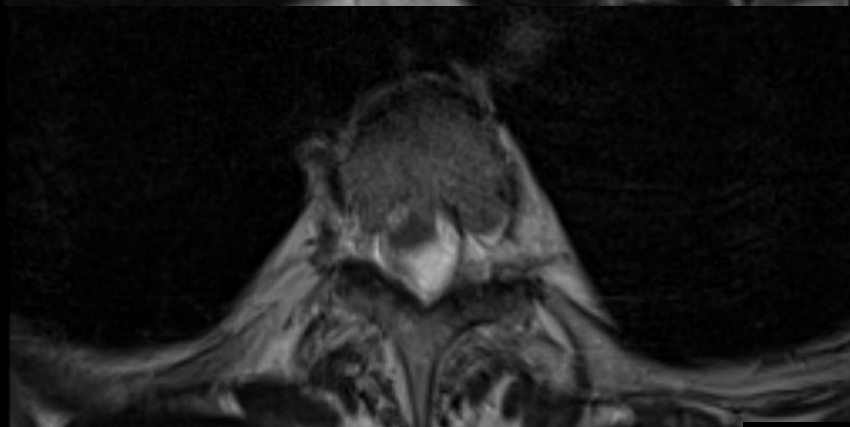


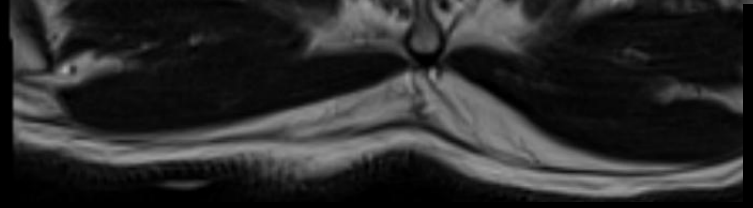


Normal spinal canal at T3

# MRI Thoracic Spine (T2-weighted)







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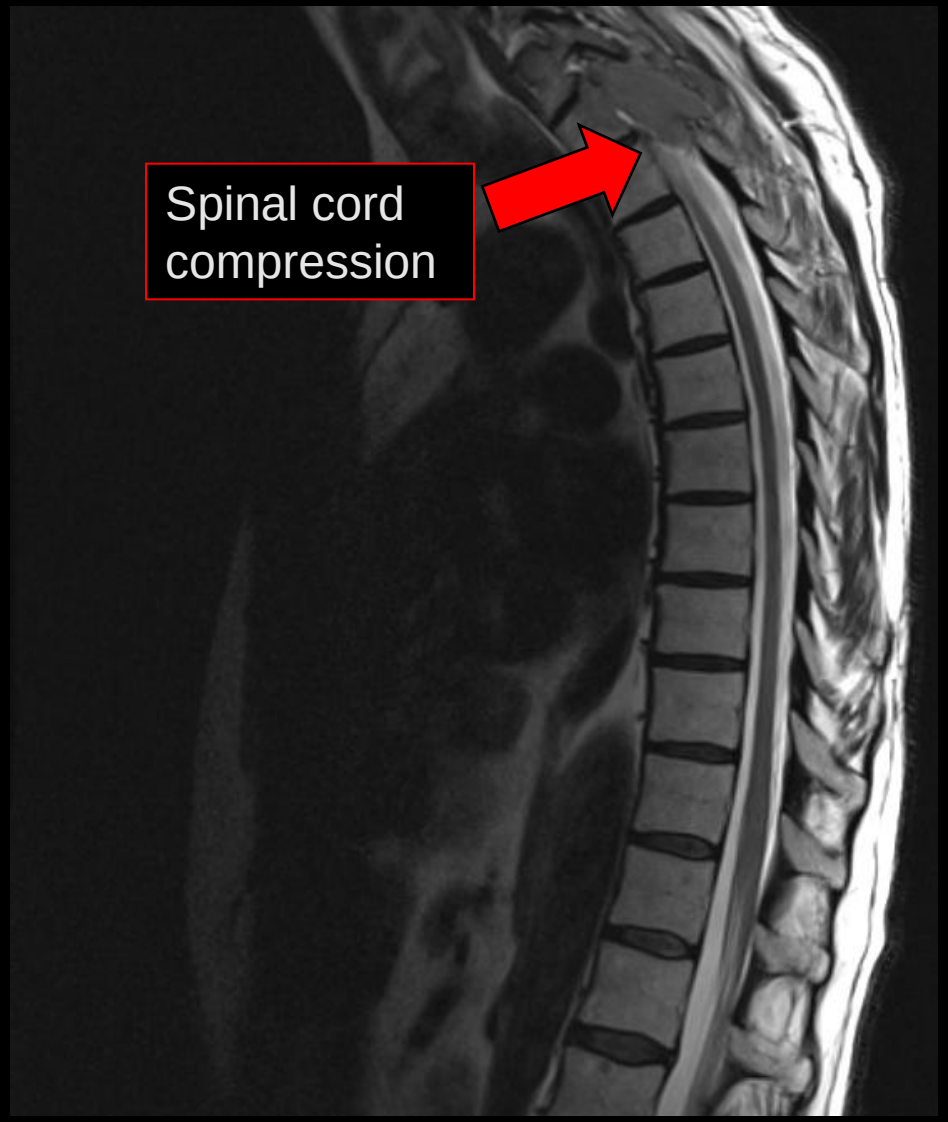



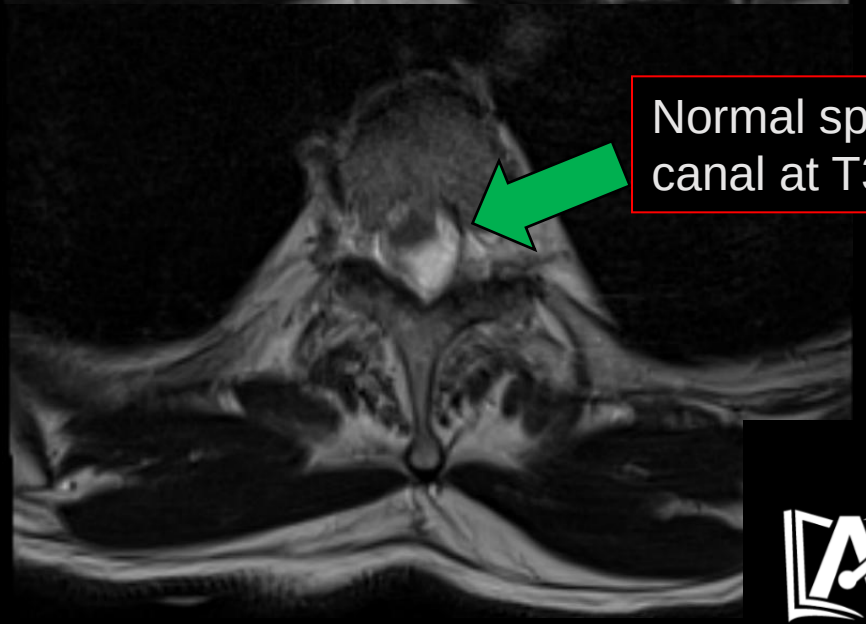


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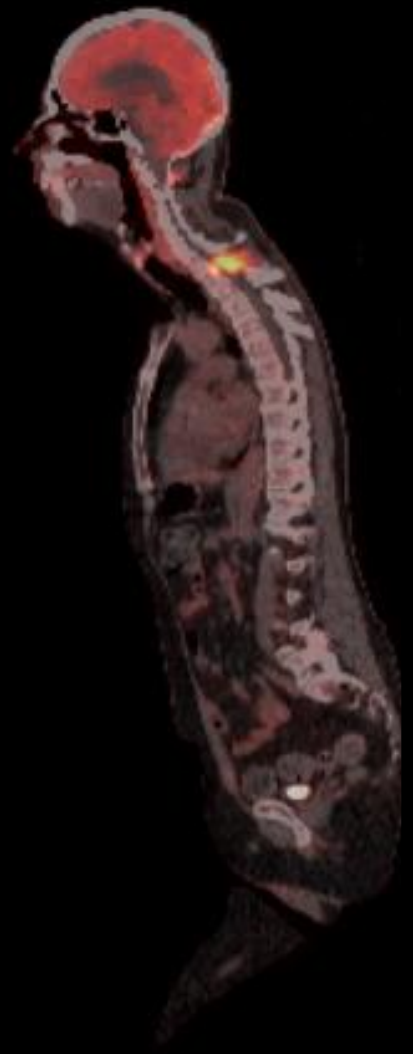
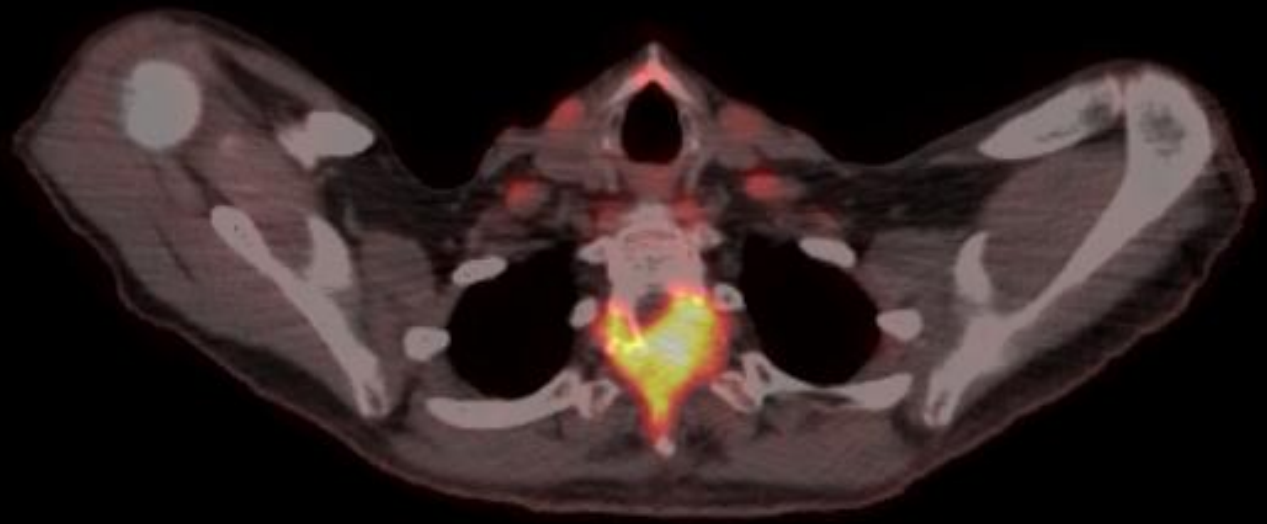
# PET/CT



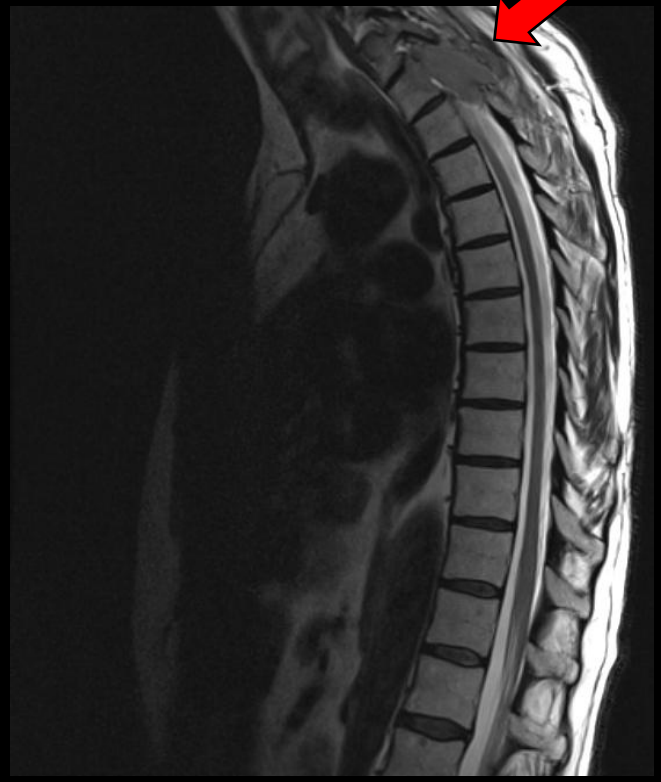


# PET/CT

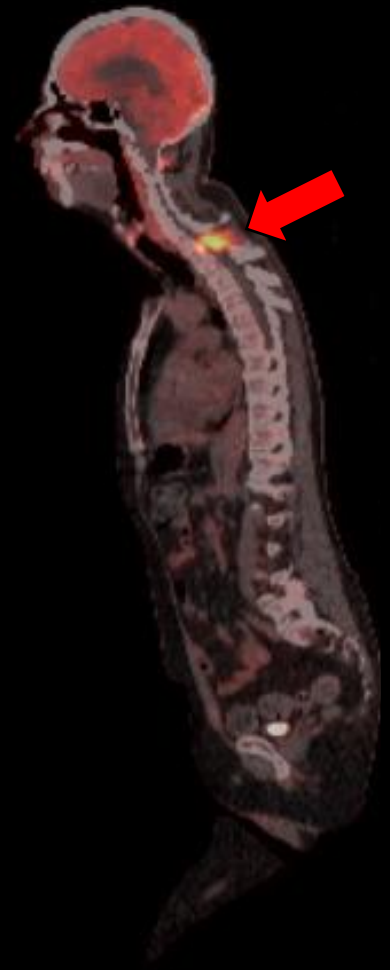

FDG-avid T2 vertebral body lesion
with extraosseous expansion

# Lesion in 3 Modalities

CT



MRI (T2-weighted)

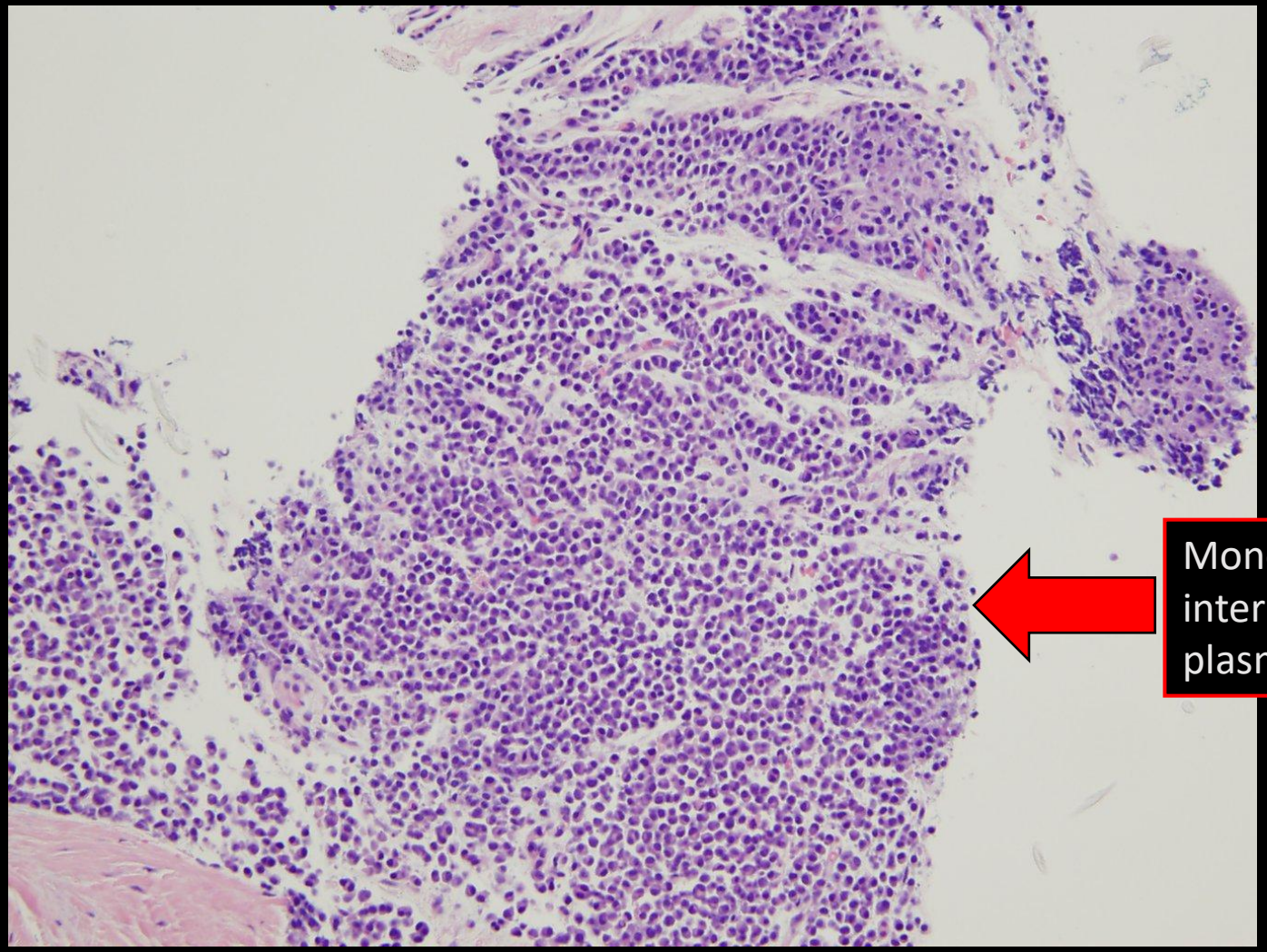


PET/CT

# DDX (based on imaging)

- Plasmacytoma
- Osteoblastoma
- Giant cell tumor
- Metastasis
- Lymphoma

# Histology



Monotonous population of intermediate to large sized plasma cells in sheets

H&E, 20x Power

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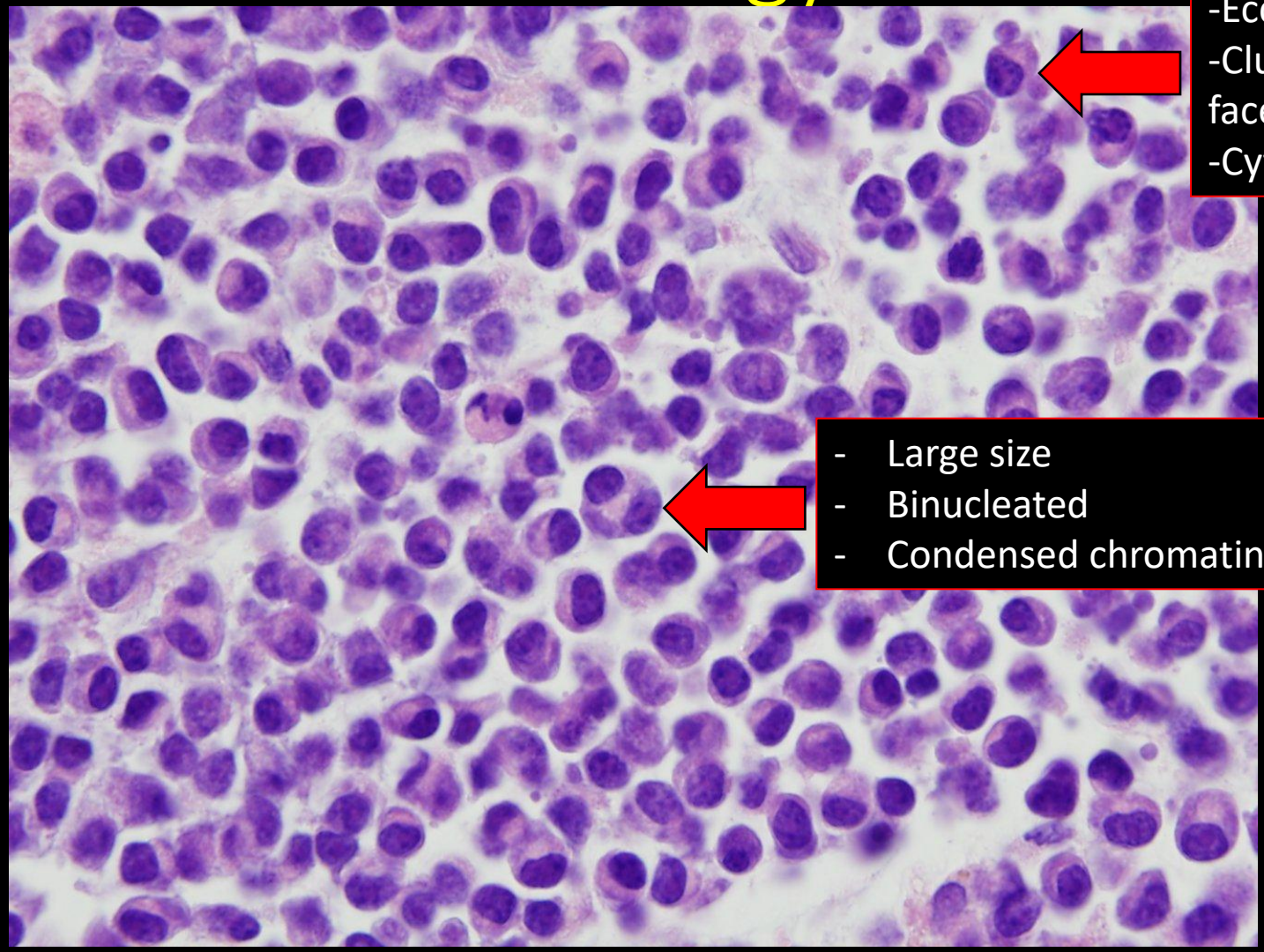
# Histology

Population of neoplastic plasma cells with varying features



-Eccentric nucleus
-Clumped chromatin (“clock face”)
-Cytoplasm clearing (“Hof”)

- Large size
- Binucleated
- Condensed chromatin

H&E, 100x Power

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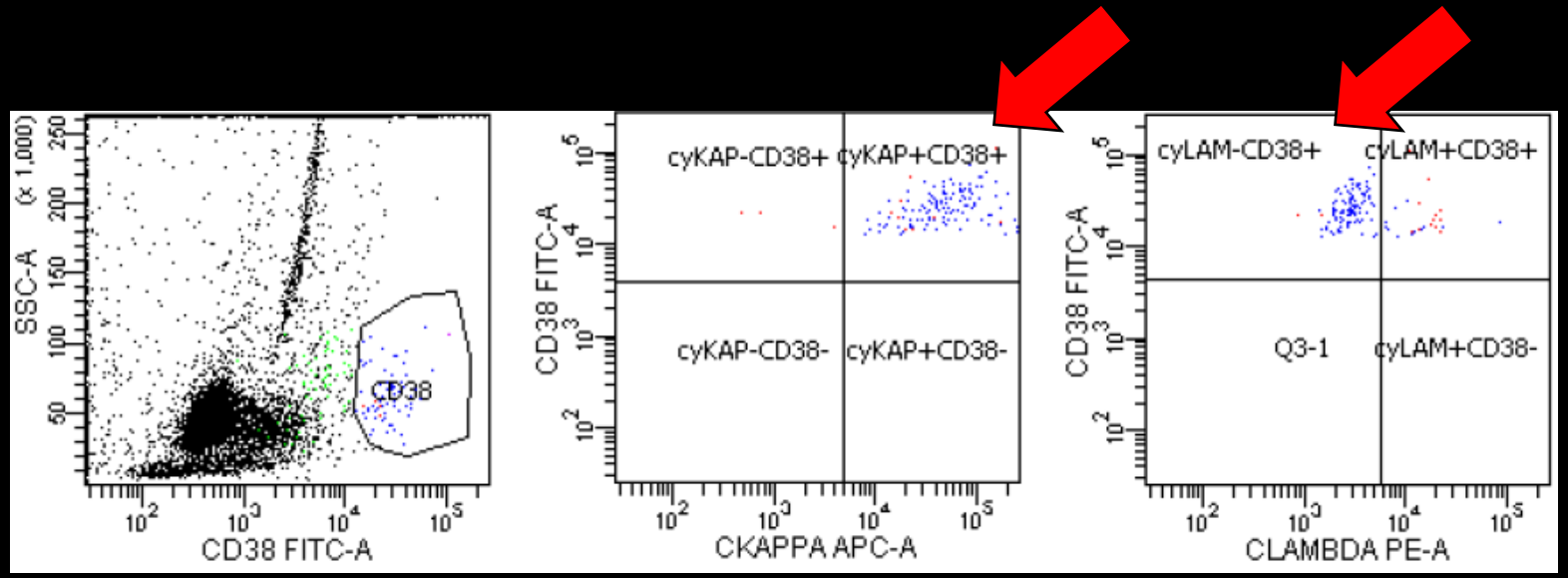
# Serum Protein Electrophoresis

| | | | Reference range |
|---|---|---|---|
| IgG | 564 mg/dL | (LO) | 700 - 1600 mg/dL |
| IgA | 936 mg/dL | (HI) | 70 - 400 mg/dL |
| IgM | 40 mg/dL | | 40 - 230 mg/dL |
| Gamma M Spike 1 | 0.82 g/dl* | | |

The patient's plasma cells have aberrant expression of IgA, resulting in an M-spike on serum protein electrophoresis (SPEP)

# Flow Cytometry




Normal Plasma Cells:

- CD38+
- Kappa-Lambda ratio: 0.26-1.65

Patient:

- CD38+
- Predominantly Kappa

# Final Dx:

Plasmacytoma

# Case Discussion

- Plasma cell neoplasms occur due to unregulated proliferation of monoclonal plasma cells.
- They can present as a solitary mass of plasma cells (solitary plasmacytoma) or as multiple lesions (multiple myeloma).
- Solitary plasmacytomas occur most commonly in bones that are hematopoietically active, especially the thoracic vertebrae.
- Rarely, plasmacytomas can arise in tissues that do not contain bone marrow.

# Case Discussion

- Solitary plasmacytomas must be differentiated from multiple myeloma, as these conditions have different prognosis and treatment.
- The diagnosis is made when there is biopsy-proven evidence of clonal plasma cells.
- However, by definition, solitary plasmacytomas are not associated with the lab abnormalities seen in multiple myeloma, such as hypercalcemia, anemia, and renal insufficiency. Although 25% of cases will have an M-spike on SPEP (as is seen in this patient).
- The main treatment is localized radiation therapy.

# References:


- Rajkumar SV, Kyle RA, Therneau TM, et al (2005). “Serum free light chain ratio is an independent risk factor for progression in monoclonal gammopathy of undetermined significance,” Blood;106(3):812-7.

- Rajkumar SV (2018). “Diagnosis and management of solitary plasmacytoma of bone.” In: *UpToDate*, Post TW (Ed), UpToDate, Waltham, MA.

- Tutkaluk A (2018). “Solitary Plasmacytoma.” In: *Leukaemia Foundation*, www.leukaemia.org.au/disease-information/myeloma/solitary-plasmacytoma/.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