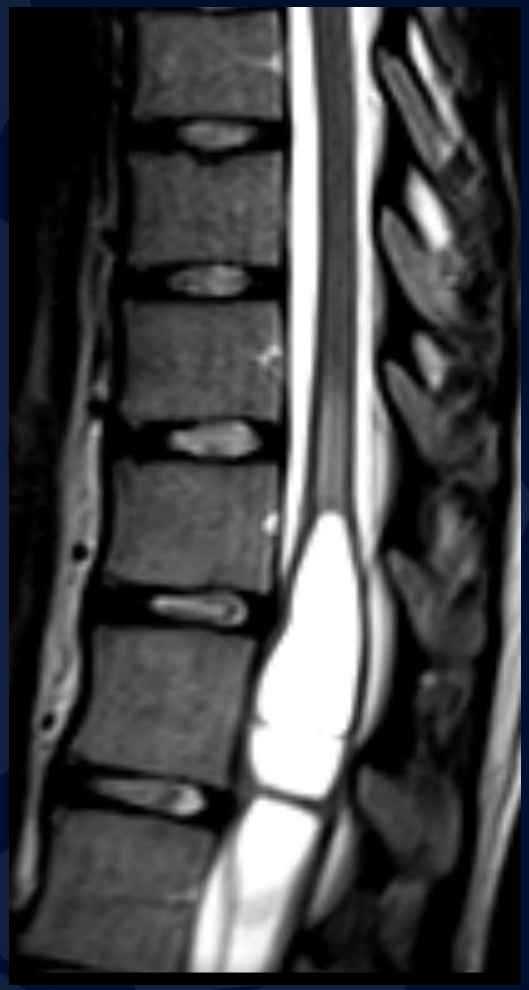
22-year-old female with h/o back pain, lower limb weakness and bowel incontinence

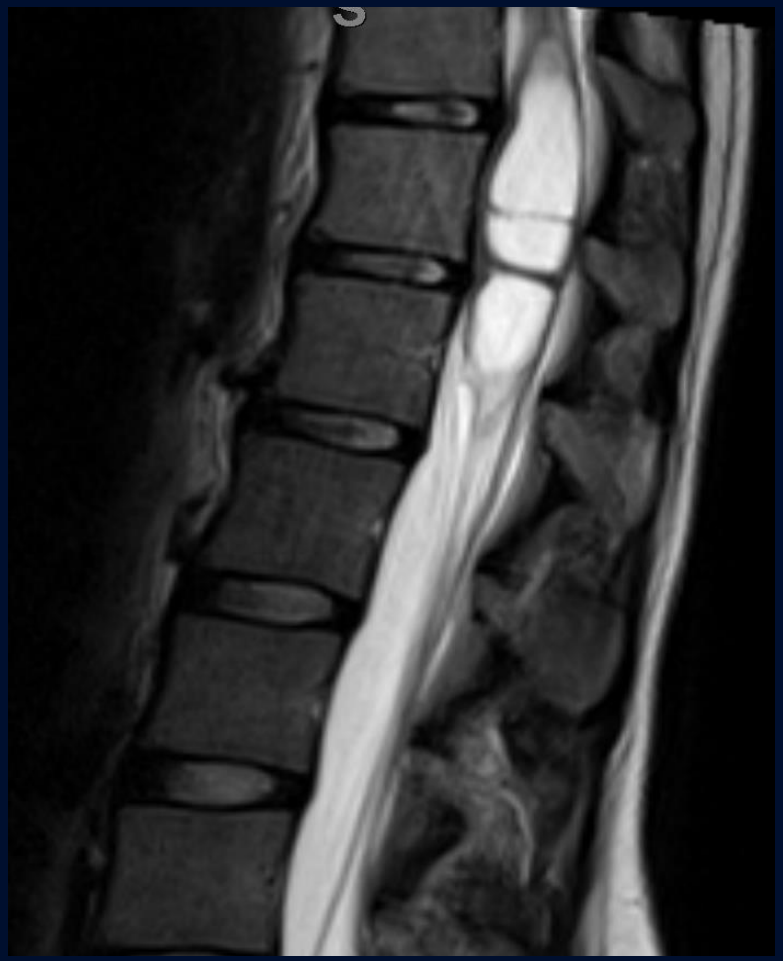
Keerthana Sharma Anand, MBBS

Leo Wolansky, MD

UCONN HEALTH
RADIOLOGY

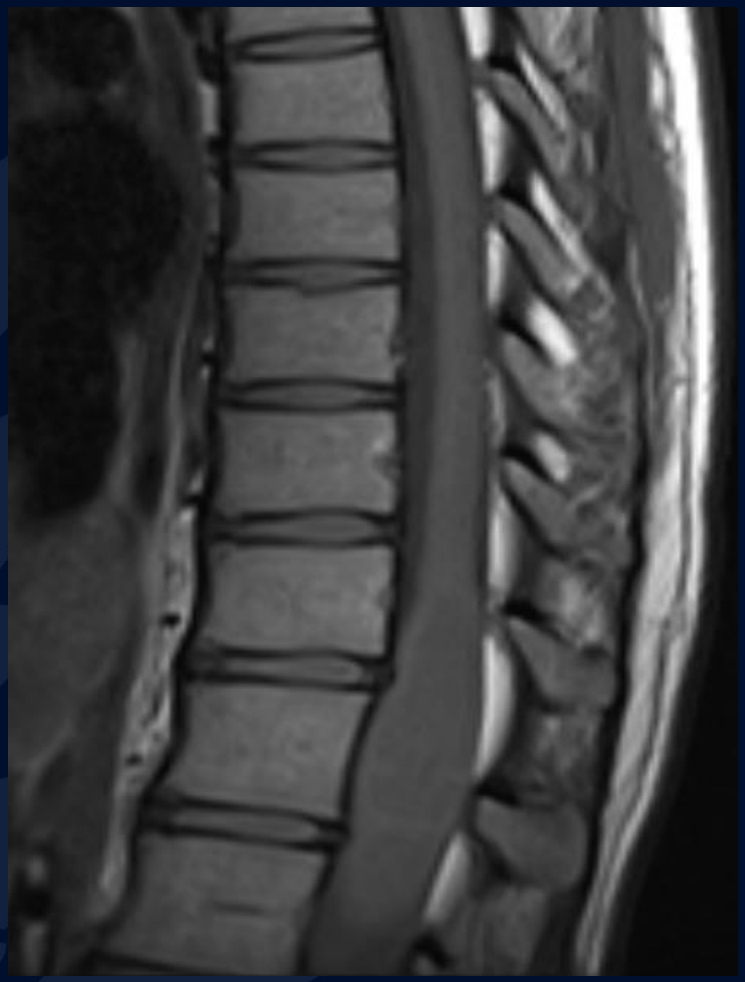


Sagittal T2 Thoracic Spine

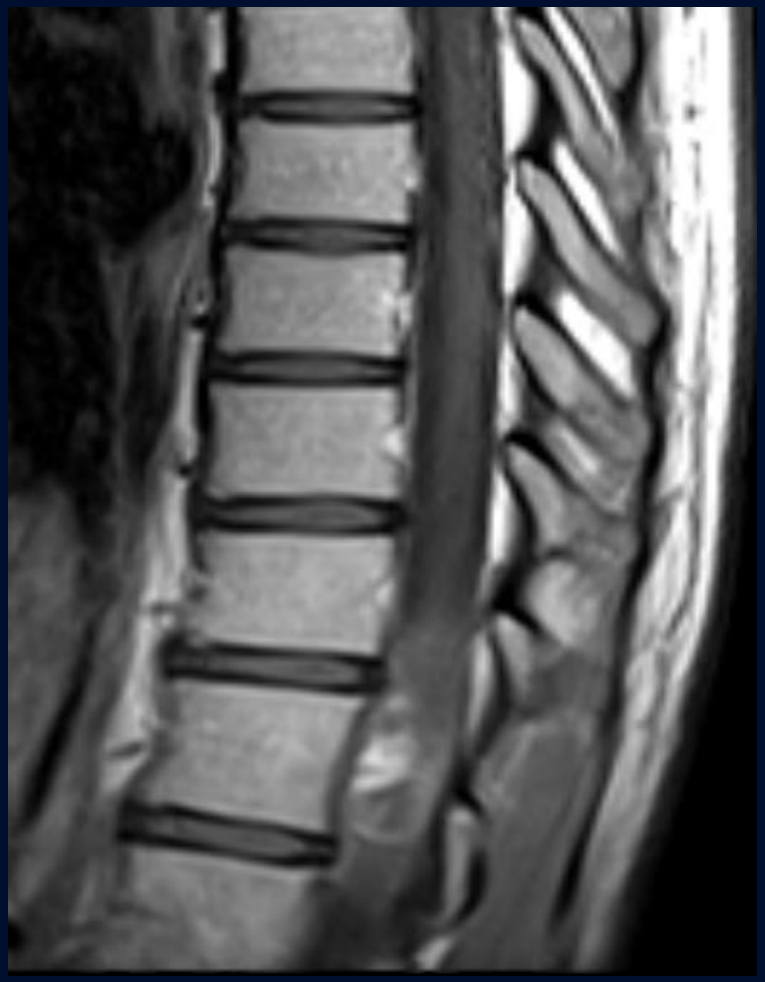


Sagittal T2 Lumbar Spine

UCONN HEALTH
RADIOLOGY



Sagittal T1 Thoracic Spine



Sagittal T1-Gd

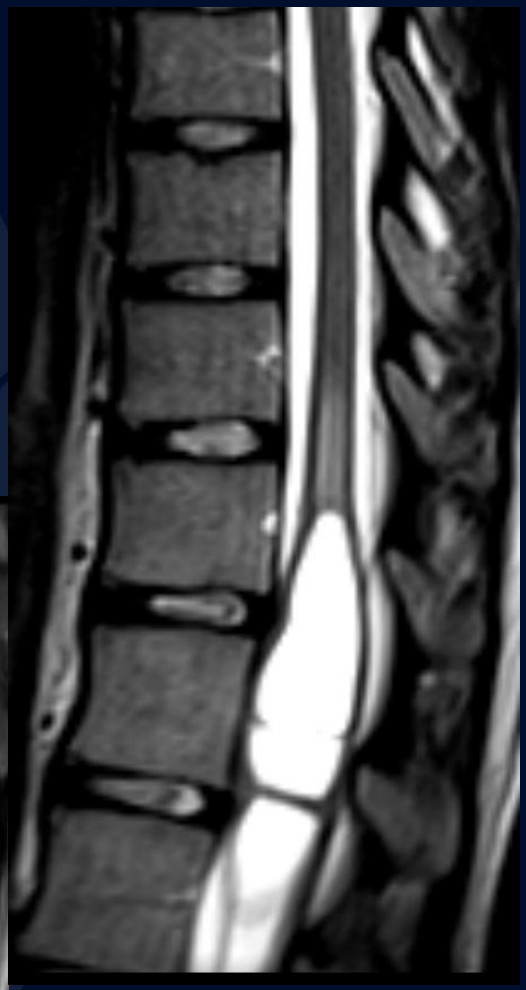
UCONN HEALTH
RADIOLOGY

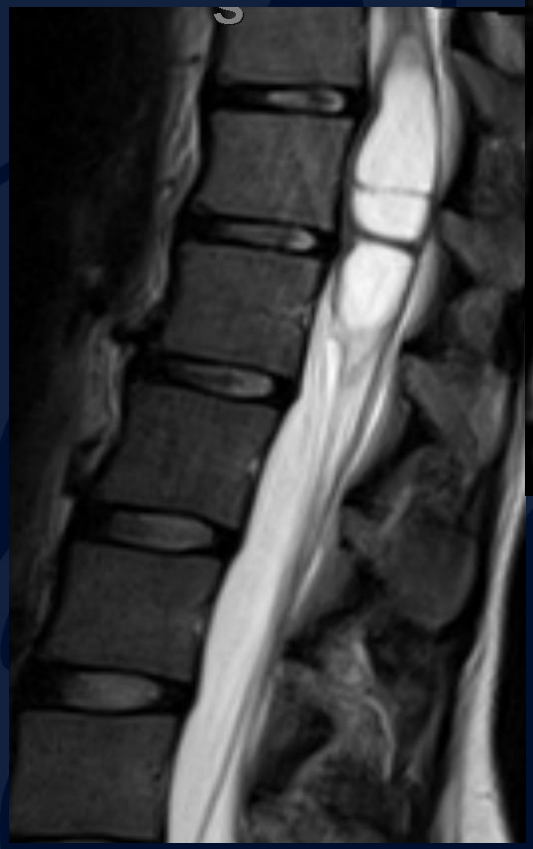
?

UCONN
HEALTH
RADIOLOGY

Pilocytic Astrocytoma of the Spinal Cord

UCONN HEALTH
RADIOLOGY



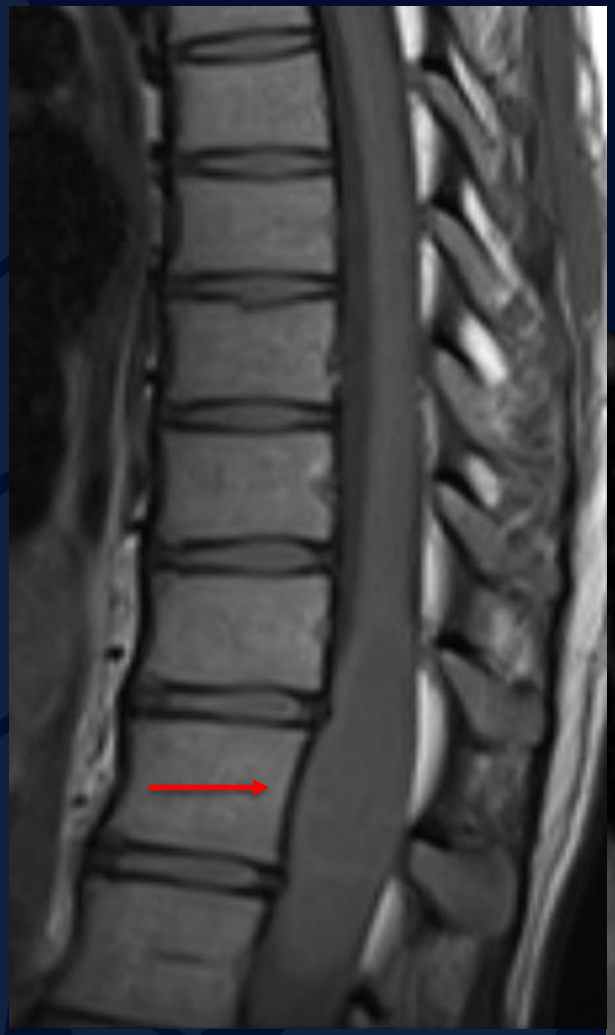


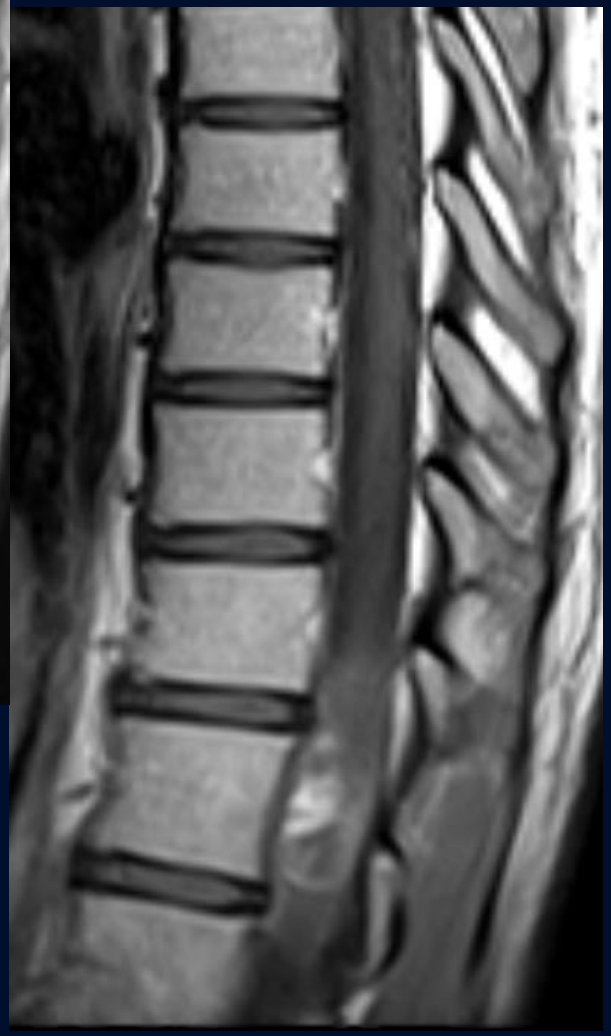
Sagittal T2 Spine

T2 hyperintense intramedullary expansile mass is seen in the conus region, which was confirmed as pilocytic astrocytoma on histology.

Hyperintense signal extending from the superior pole of tumor could be due to edema or infiltration.

UCONN HEALTH
RADIOLOGY



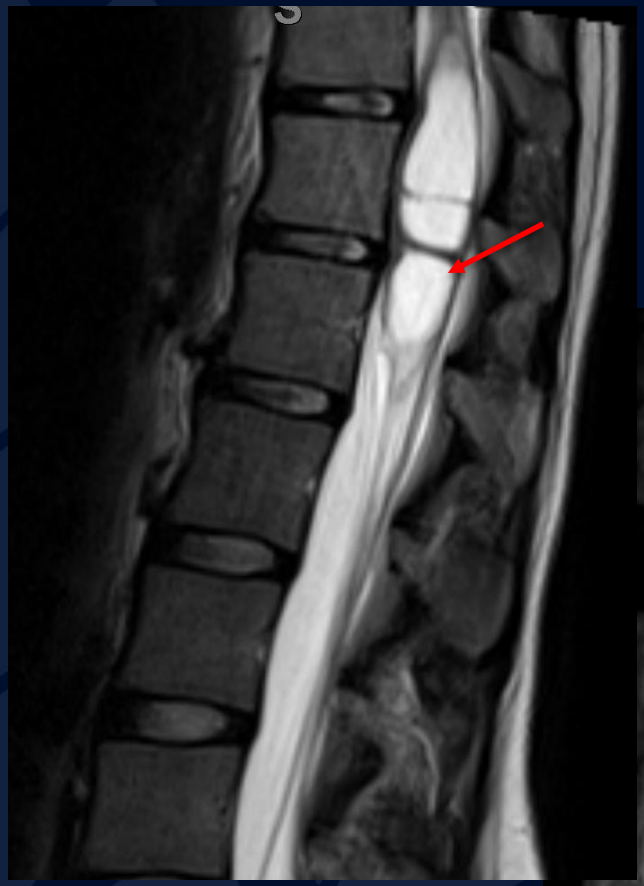


T1 Pre & Post Constrast

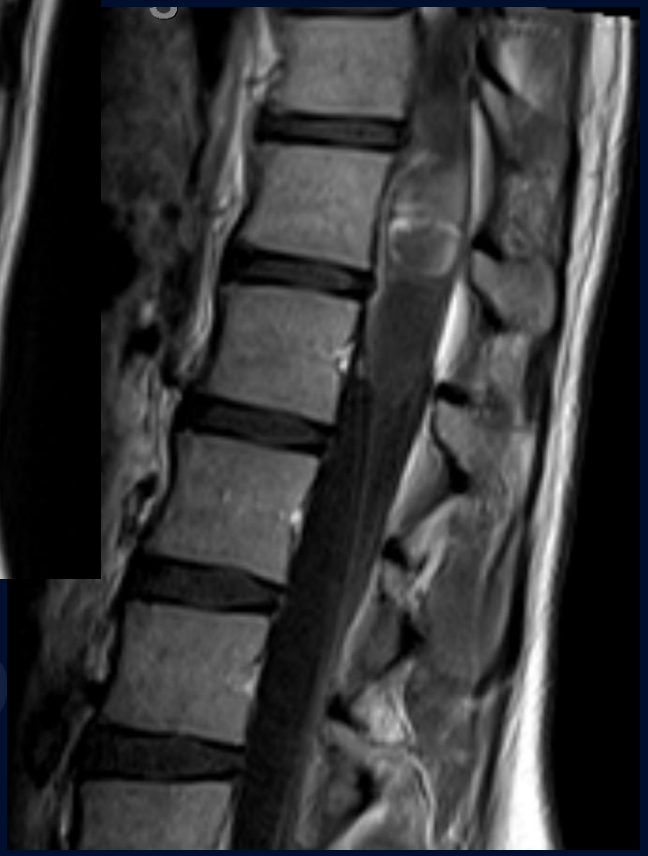
The tumor is iso- to hypointense with the rest of cord on T1. Cord expansion with mild scalloping of vertebral body is seen (red arrow).

Patchy enhancement is seen post-contrast.

UCONN HEALTH
RADIOLOGY



T2 Lumbar Spine



T1 Gd

T2 hyperintensity in astrocytoma may be due to hyperintense solid tumor as well as intra/peritumoral cysts.

Here, hyperintensity in the lower pole of tumor does not enhance post-contrast, which with pilocytic astrocytoma indicates cystic component.

UCONN HEALTH
RADIOLOGY

Spinal Pilocytic Astrocytoma

General features:

- Second most common intramedullary tumor after ependymoma in adults. Most common intramedullary tumor in children.
- Increased incidence in neurofibromatosis (NF1, NF2)

Pathology:

Primary spinal cord neoplasm arising from astrocytes. Usually of lower grade than those found in the brain.

Rosenthal fibres seen in pilocytic astrocytoma.

WHO Grading of Spinal Astrocytomas

I: Pilocytic astrocytoma
II: Fibrillary/ Diffuse astrocytoma
III: Anaplastic astrocytoma
IV: Glioblastoma

UCONN HEALTH
RADIOLOGY

Imaging Findings

Location: Cervival > thoracic > lumbar. Lesions usually span <4 vertebral body segments. Holocord involvement seen in children.

CT: Osseous remodeling seen as vertebral body scalloping or thinned pedicles. Mild enhancement may be seen, but less sensitive than MR.

MRI: Contrast enhanced MR is the modality of choice.

- T1: Cord expansion seen. Lesion iso- to hypointense with rest of cord.
- T1 C+: majority enhance with usually patchy enhancement pattern. May help differentiate edema from tumor infiltration.
- T2: Hyperintense solid tumor with bright cystic components. Cystic components will not enhance.

PET: Increased 18F-FDG uptake.

Myelography: Non-specific cord enlargement with possible block to normal contrast flow.

UCONN HEALTH
RADIOLOGY

Clinical Features

- Similar presentation to other intramedullary tumors. Usually presents with insidious back pain that is worse in recumbent position.
- May also present with myelopathy, scoliosis (due to bone remodeling) or cauda equina syndrome.
- Hydrocephalus in cervicomedullary lesions

Treatment:

- Survival depends on tumor grade, most are slow growing.
- Total resection indicated when possible. Role of chemo/radiotherapy unclear.

UCONN HEALTH
RADIOLOGY

Differential Diagnoses

- Ependymoma: Central location, hemorrhage more common with hemosiderin capping, more frequent and prominent cysts. Can be radiologically indistinguishable from astrocytoma.

  Myxopapillary variant is commonly seen as an intramedullary mass within the conus medullaris.
- Ganglioglioma: similar imaging features, seen more commonly in pediatric population
- Multiple sclerosis: Lesions involve < ½ of cross section of cord, usually seen dorsally
- Metastases: Thin rim of peripheral enhancement or flame-shaped enhancement- rim/flame sign is highly specific for mets

UCONN HEALTH
RADIOLOGY

References

- Intramedullary Masses of the Spinal Cord: Radiologic-Pathologic Correlation. Robert Y. Shih and Kelly K. Koeller. RadioGraphics 2020 40:4, 1125-1145

- Radiopaedia: Spinal Astrocytoma. https://radiopaedia.org/articles/spinal-astrocytoma

- STATdx: Spinal Cord Astrocytoma. Blaise V. Jones, MD.

- Spinal Pilocytic Astrocytoma. Sharma K, Wolansky L. Radiology Online (2021)

UCONN HEALTH
RADIOLOGY