

AMSER Case of the Month

July 2026

38-year-old female with lower back pain

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Patient Presentation

- 38-year-old female reported feeling 8/10 lower back and sciatic pain with difficulty lifting her right leg and bending forward.
- X-ray showed mild intervertebral disc space narrowing at multiple levels.
- Oral steroids, gabapentin, home exercises, and physical therapy were provided but resulted in minimal to no relief.
- Symptoms continued to worsen despite treatment over the course of 9 weeks.

Pertinent Labs

- No pertinent labs

What Imaging Should We Order?

ACR Appropriateness Criteria

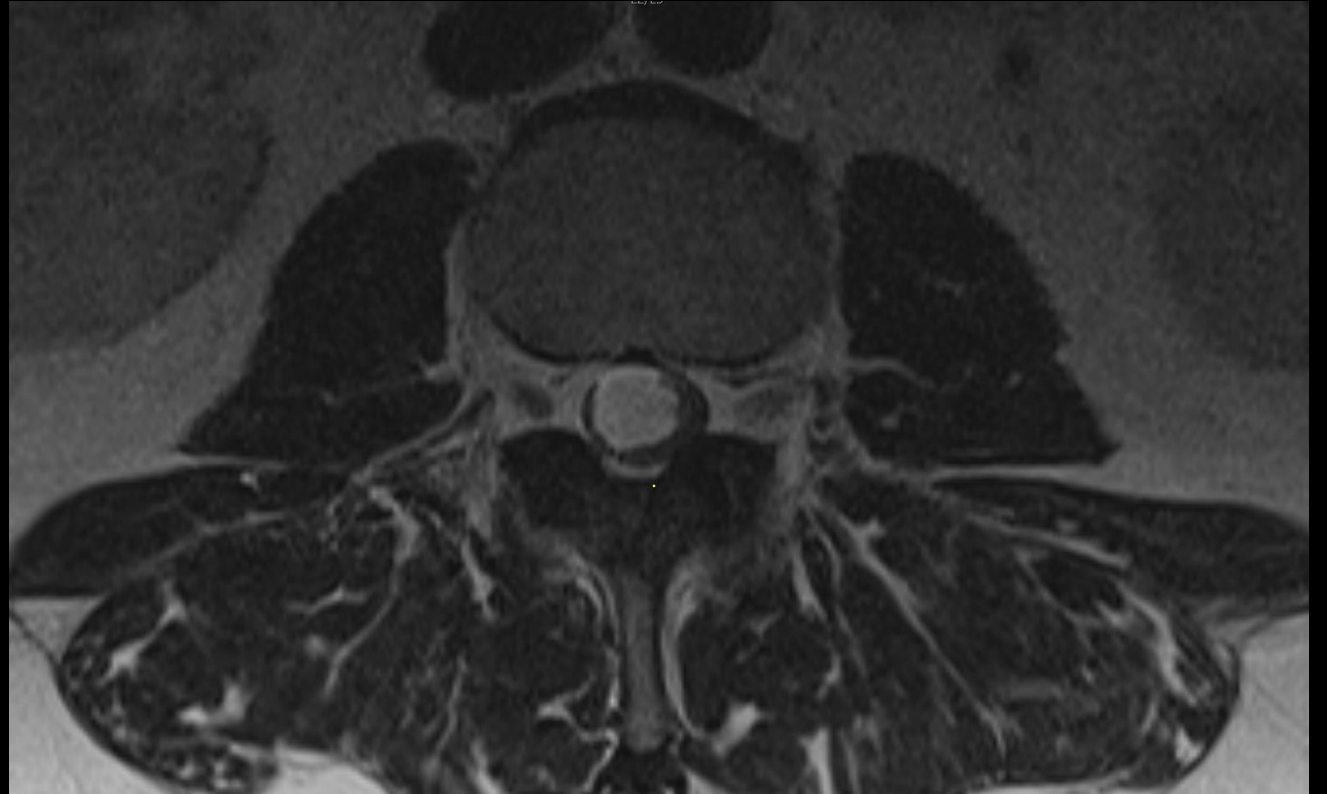
Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Low back pain, subacute, intervention candidate, persistent symptoms after 6 wks medical management, initial imaging	3194297	● MRI lumbar spine without IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		● Radiography lumbar spine	1-10 mSv ☼☼☼	0.03-0.3 mSv [ped] ☼☼	May be appropriate
		● MRI lumbar spine without and with IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		● Bone scan whole body with SPECT or SPECT/CT complete spine	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	May be appropriate
		● CT lumbar spine without IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	May be appropriate
		● CT myelography lumbar spine	10-30 mSv ☼☼☼☼		May be appropriate
		● MRI lumbar spine with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● CT lumbar spine with IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually not appropriate
		● Discography and post-discography CT lumbar spine	1-10 mSv ☼☼☼		Usually not appropriate
		● CT lumbar spine without and with IV contrast	10-30 mSv ☼☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually not appropriate
		● FDG-PET/CT whole body	10-30 mSv ☼☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually not appropriate

This imaging modality was ordered by the ER physician

MRI Lumbar Spine w/o Contrast

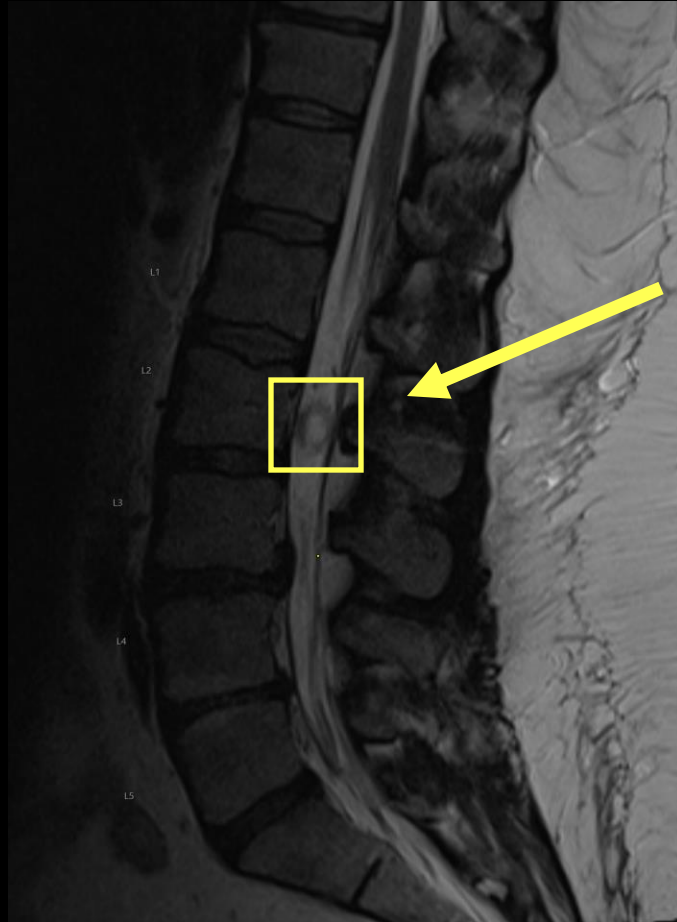


Saggital T2



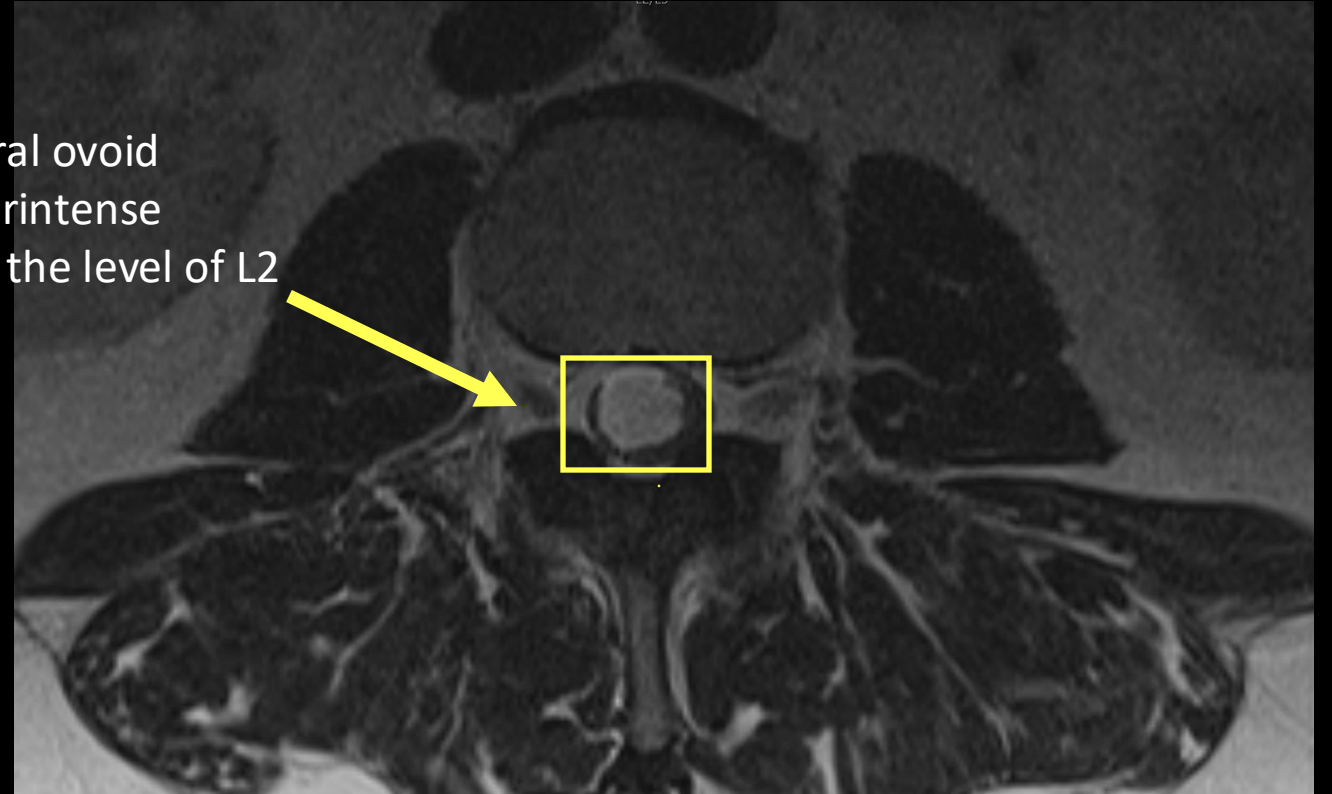
Axial T2

Findings



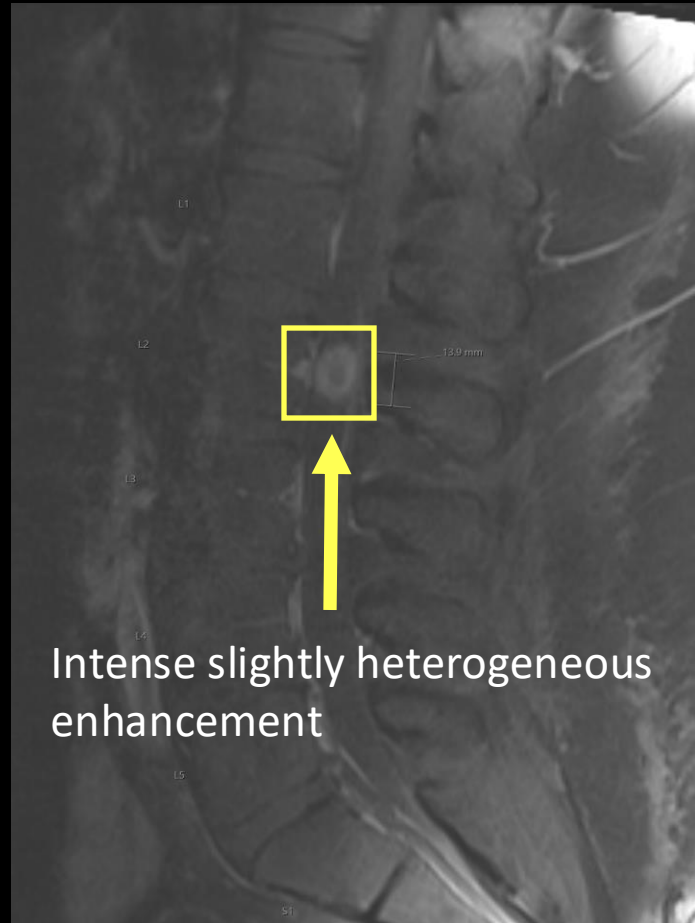
Sagittal T2

Intradural ovoid
T2 hyperintense
mass at the level of L2



Axial T2

Repeat Imaging with Contrast



Sagittal T1



Axial T1

Final Dx:

Cauda Equina Neuroendocrine Tumor

Case Discussion

- Neuroendocrine tumors, or paragangliomas, are tumors that arise from extra-adrenal neural crest-derived neuroendocrine cells. These tumors can arise systemically or within the CNS.¹
- Occurrence within the CNS is uncommon, however common locations where they arise include the jugulotympanic area or the region of the cauda equina.²
- Tumors occurring within cauda equina region can present with lower back pain, radicular pain, and sensory motor deficits.
- These tumors are generally indolent and rarely metastasize. They can usually be cured with resection but cases of recurrence have been noted.^{2,3}

Case Discussion

- The most common arising tumors of the conus medullaris and filum terminale are myxopapillary ependymomas and neuroendocrine tumors.²
- Microscopically, the chief cells, the bulk of the tumor, are arranged in nests in a Zellballen pattern around which are a single layer of sustentacular cells.
- Immunohistochemically, sustentacular cells stain positively for S-100 protein while the chief cells stain positive for synaptophysin, neuron-specific enolase, chromogranin, and neurofilament.³

Management

- Treatment of these tumors involve laminectomy and resection.
- The patient's tumor arose from the filum terminale which allowed for en bloc resection to decrease the risk of recurrence from piecemeal debulking.⁴
- Confirmation of the tumor in the location of the filum terminale is done using stimulation of the filum proximal and distal to the tumor followed by the lack of activity.
- The patient tolerated the procedure and was discharged home with a prescription for PT and pain relief medication.

References:

1. Ikram A, Rehman A. StatPearls. February 29, 2024. Accessed March 25, 2026. <https://www.ncbi.nlm.nih.gov/books/NBK549834/>
2. Perry A, Rosenblum MK. Central Nervous System. In: Goldblum JR, Lamps LW, McKenney JK, Myers JL, eds. *Rosai and Ackerman's Surgical Pathology*. 11th ed. Elsevier; 2018. Accessed March 22, 2026. <https://www.clinicalkey.com>.
3. Prayson RA. Non-glial Tumors. In: Prayson RA, Yeaney G, Goldblum JR, eds. *Neuropathology: Foundations in Diagnostic Pathology*. 3rd ed. Elsevier; 2023. Accessed March 22, 2026. <https://www.clinicalkey.com>.
4. Sellin JN, Tatsui CE, Rhines LD. Evaluation and Treatment of Benign Intradural Extramedullary Tumors. In: Winn RH, ed. *Youmans and Winn Neurological Surgery*. 8th ed. Elsevier; 2023. Accessed March 27, 2026. <https://www.clinicalkey.com>.