



Non-CME Webinar Series
designed with the trainee in mind

first Tuesday of the month



When to Order and How to Interpret? Imaging in Pain Medicine

Sayed Emal Wahezi, MD

Montefiore Medical Center

Program Director, Pain Medicine Fellowship



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- Basics of MRI and CT
- Case presentations



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- MRI

- Magnet affects proton +/- molecular motion
- Image produces physiologic information
- Soft tissue analysis
 - muscle, ligament, tendon, fluid, and fat analysis
- Variable anatomic/physiologic information

- T1

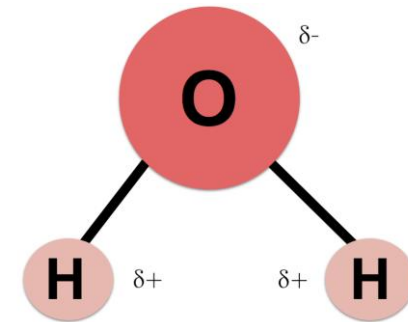
- High Intensity (Fat)
- Low Intensity (Fluid)

- T2

- High Intensity (Fat and Fluid)
- Low Intensity (muscle, bone)

- STiR

- High Intensity (Fluid)
- Low Intensity (Fat)





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- CT
 - Matrix of many Xray beans
 - Best for bone analysis
 - Can assess soft tissue
 - Myelography or intra-articular contrast
 - Disc, muscle, joints, (Hounsfield units)
 - Can assess for pseudarthrosis

Substance	HU
Air	-1000
Lung	-500
Fat	-100 to -50
Water	0
CSF	15
Kidney	30
Blood	+30 to +45
Muscle	+10 to +40
Grey matter	+37 to +45
White matter	+20 to +30
Liver	+40 to +60
Soft Tissue, Contrast	+100 to +300
Bone	+700 (cancellous bone) to +3000 (dense bone)



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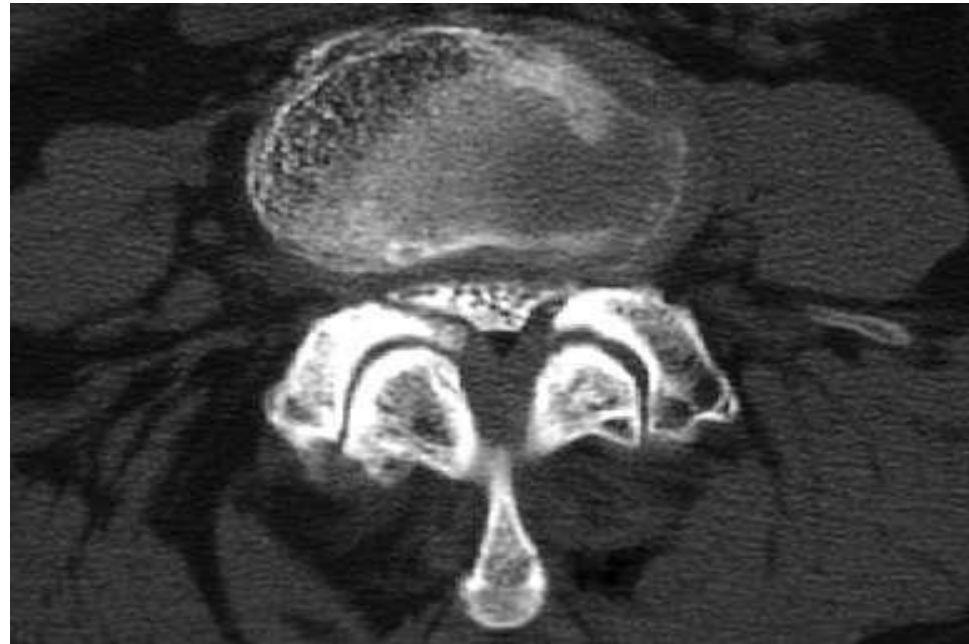
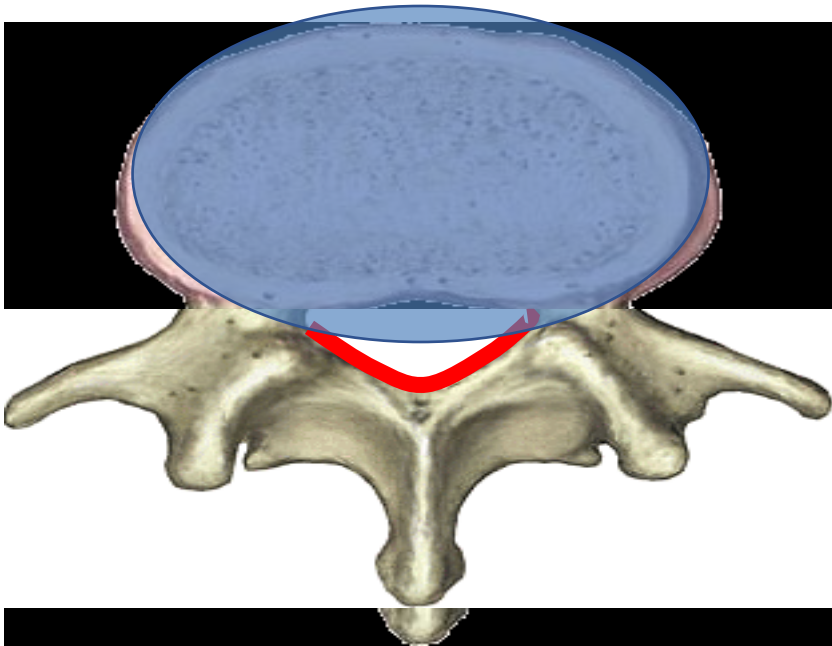
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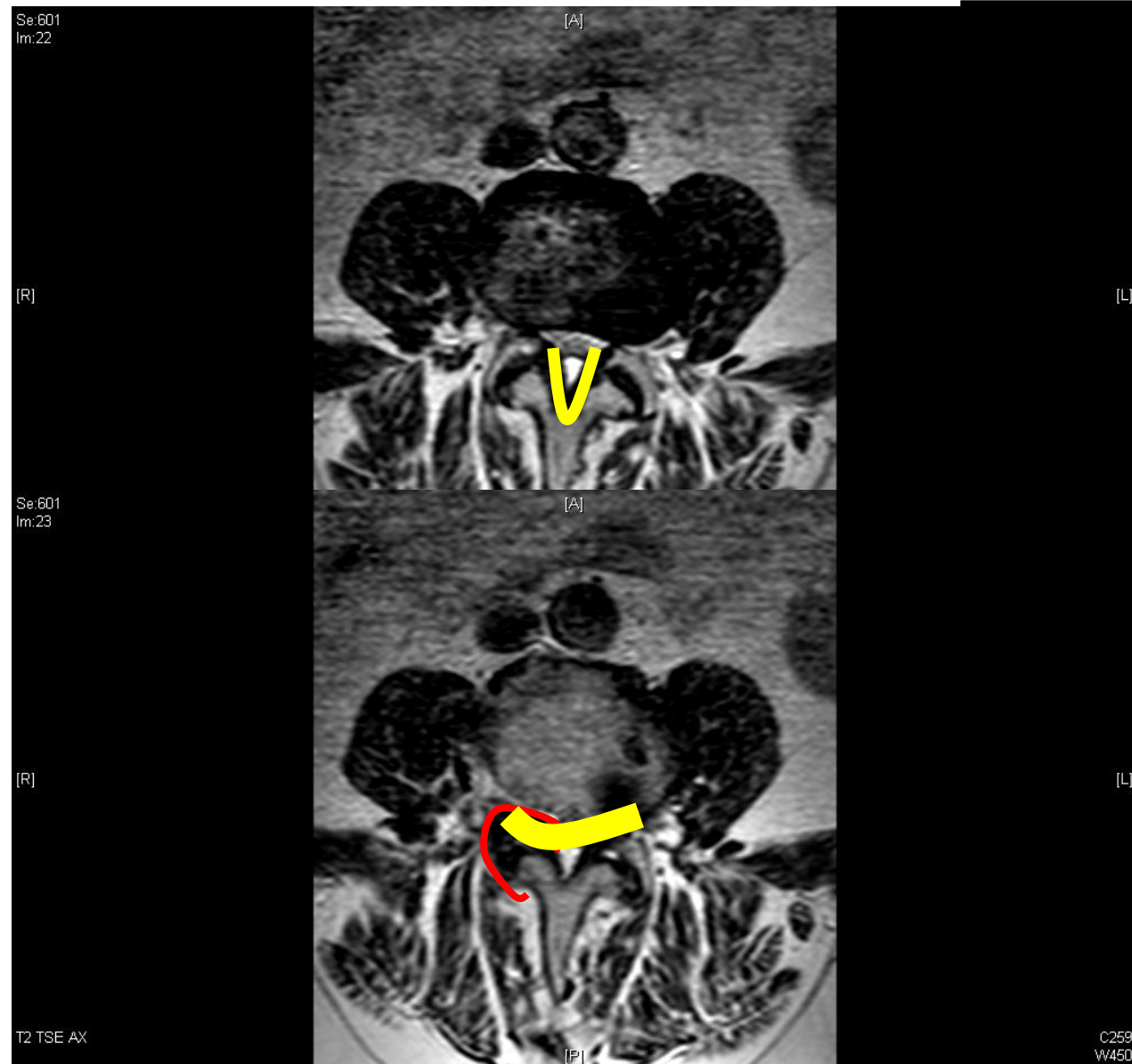


- Central Canal Stenosis

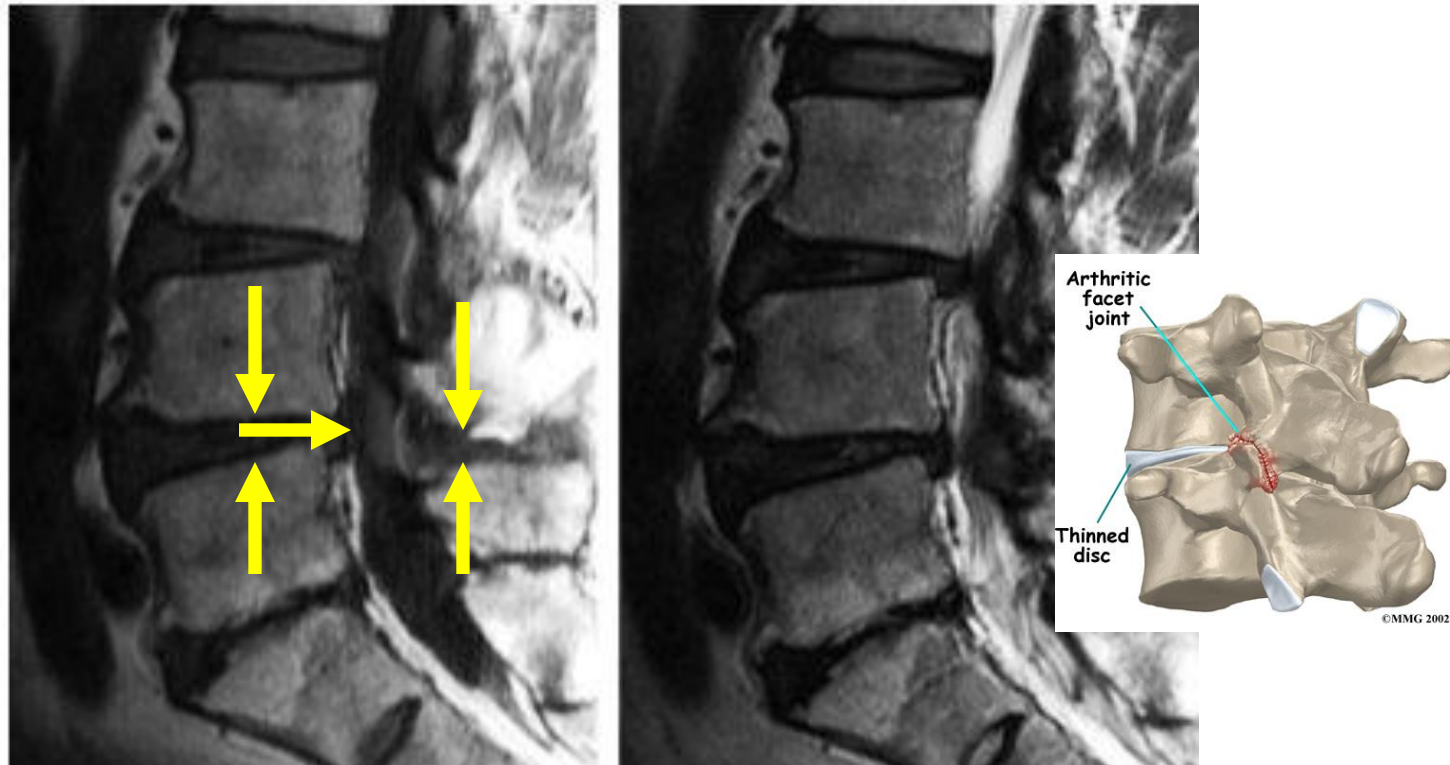
Central Lumbar Stenosis



Acquired Lumbar Spinal stenosis

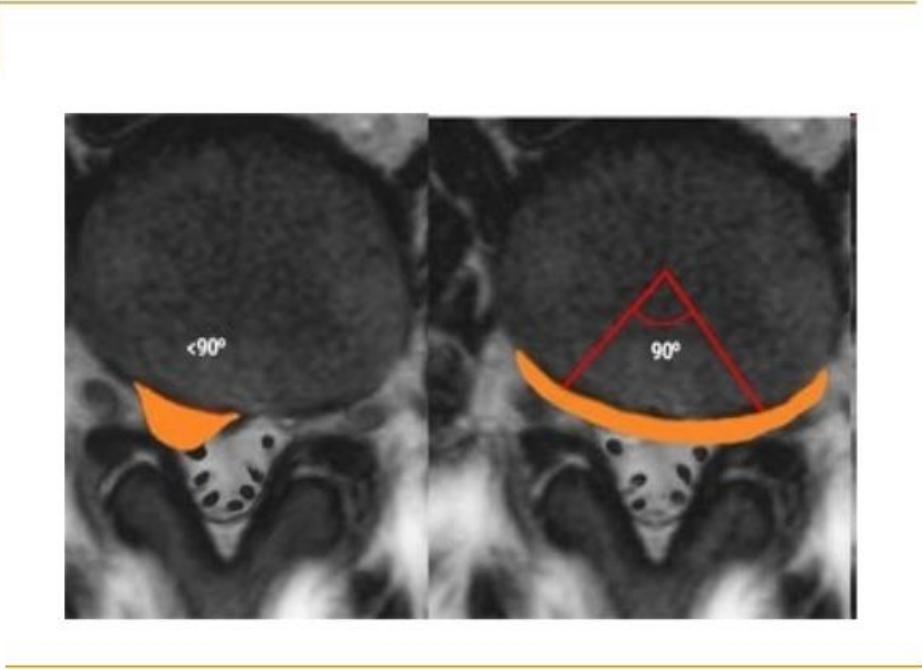


Pathodynamics



- Kirkaldy-Willis WH, ed. The pathology and pathogenesis of low back pain. *Managing Low Back Pain*. New York, NY: Churchill Livingstone; 1988:49.
- Saal JS, Franson RC, Dobrow R, et al. High levels of inflammatory phospholipase A2 activity in lumbar disc herniations. *Spine*. Jul 1990;15(7):674-8.
- Saal JS, Sibley R, Dobrow R, et al. Cellular response to lumbar disc herniation: an immunohistologic study. Presented at: Annual Meeting of the International Society for the Study of the Lumbar Spine; June 1990; Boston, Mass.
- Beattie PF. Current understanding of lumbar intervertebral disc degeneration: a review with emphasis upon etiology, pathophysiology, and lumbar magnetic resonance imaging findings. *J Orthop Sports Phys Ther*. Jun 2008;38(6):329-40.

Spinal Stenosis





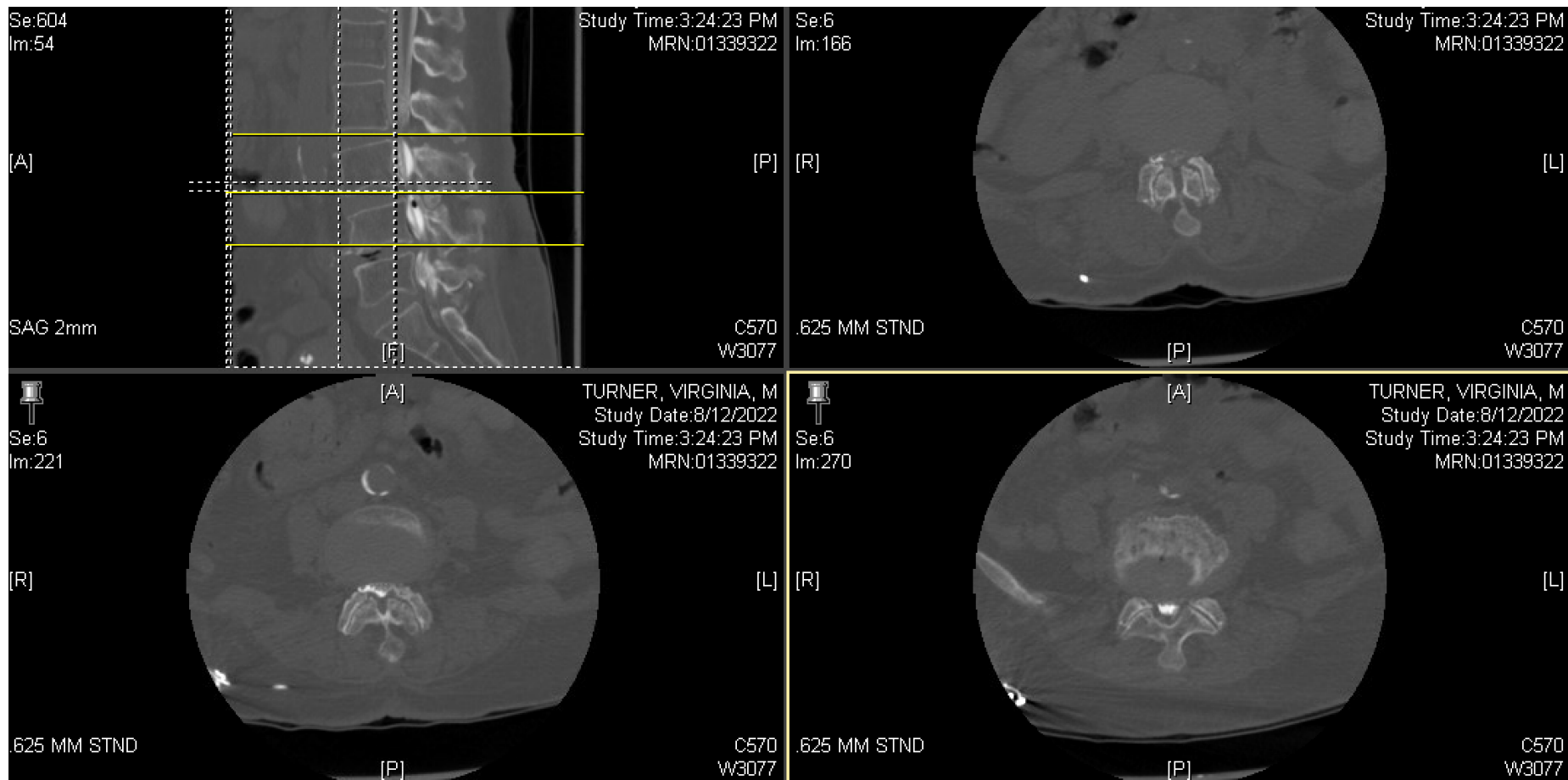
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- CT myelogram with greatest CSF defect at L23





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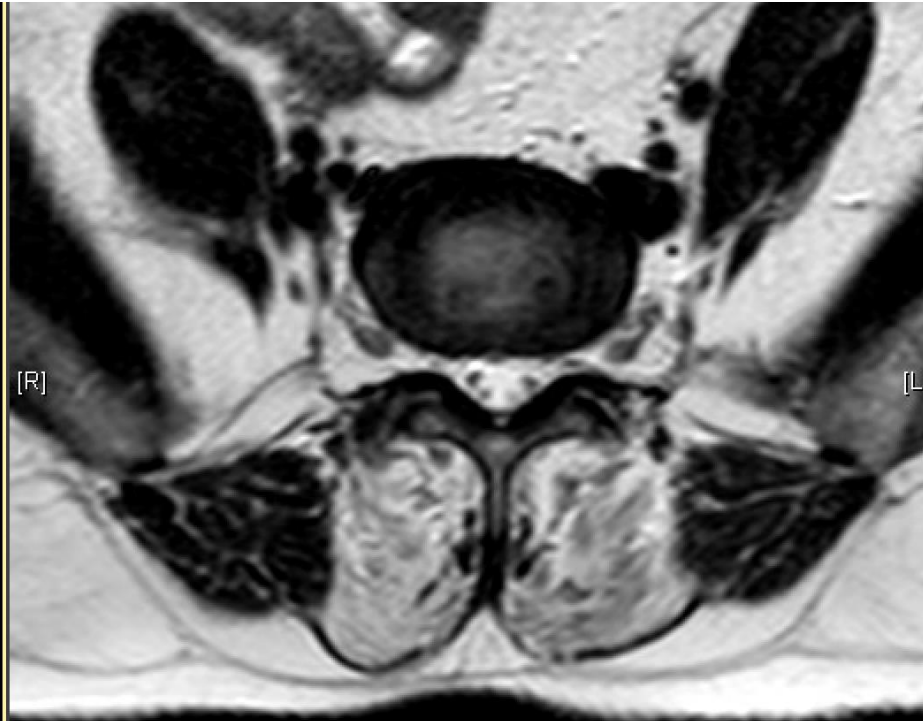
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AG T2

[F]



C172

W299

AX T2 DISC

[PH]

C134

W233



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- Neuroforaminal Stenosis

[J Pain Res.](#) 2022; 15: 1515–1526.

PMCID: PMC9148210

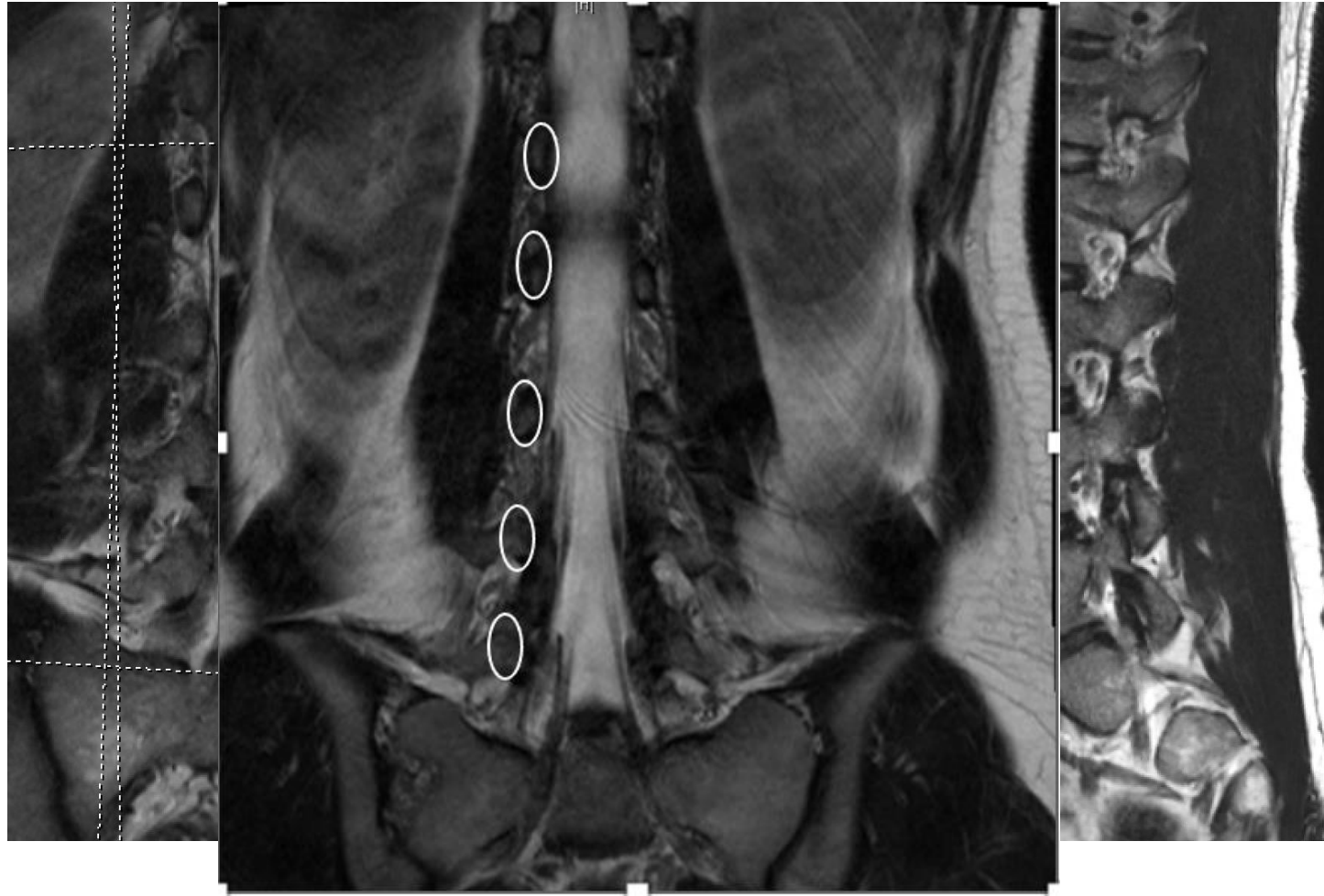
Published online 2022 May 24. doi: [10.2147/JPR.S360847](https://doi.org/10.2147/JPR.S360847)

PMID: [35637764](https://pubmed.ncbi.nlm.nih.gov/35637764/)

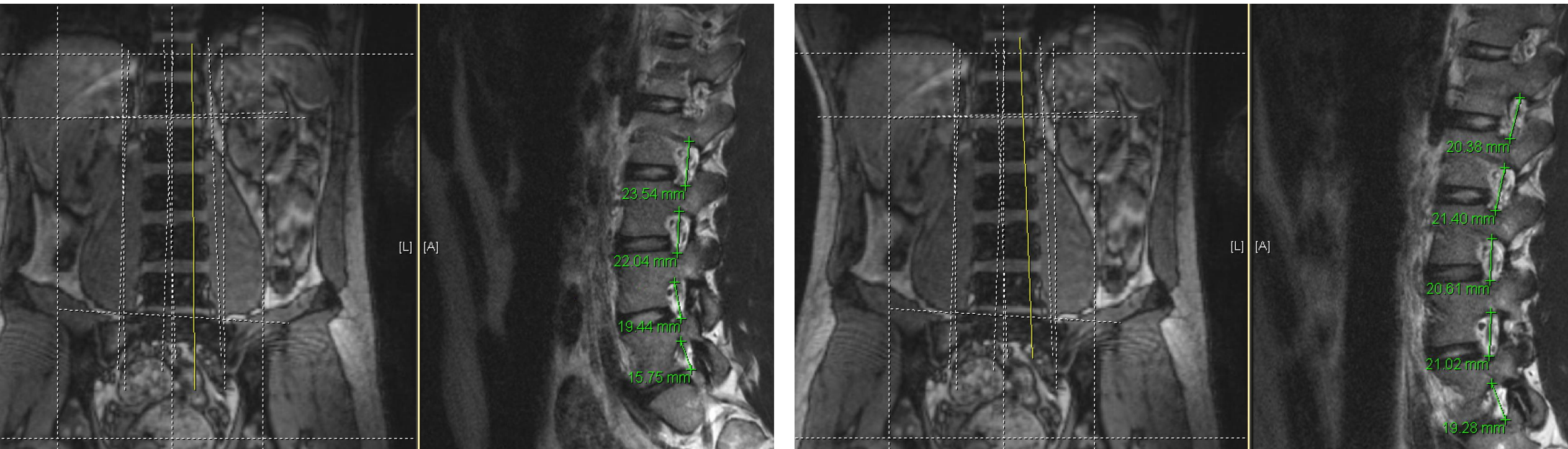
MRI and Anatomical Determinants Affecting Neuroforaminal Stenosis Evaluation: A Descriptive Observational Study

[Sayed E Wahezi](#),¹ [Terence Hillery](#),² [Rene Przkora](#),³ [Tim Lubenow](#),⁴ [Tim Deer](#),⁵ [Chong Kim](#),² [Dawood Sayed](#),⁶
[Jonathan Krystal](#),⁷ [Merritt Kinon](#),⁸ [Kishan Sitapara](#),⁷ [Kim Nguyen](#),⁷ [Daniel Wong](#),⁷ and [Karen Sperling](#)⁷

Is this a true sagittal slice? Why/not?



How does a coronal oblique affect NF analysis?



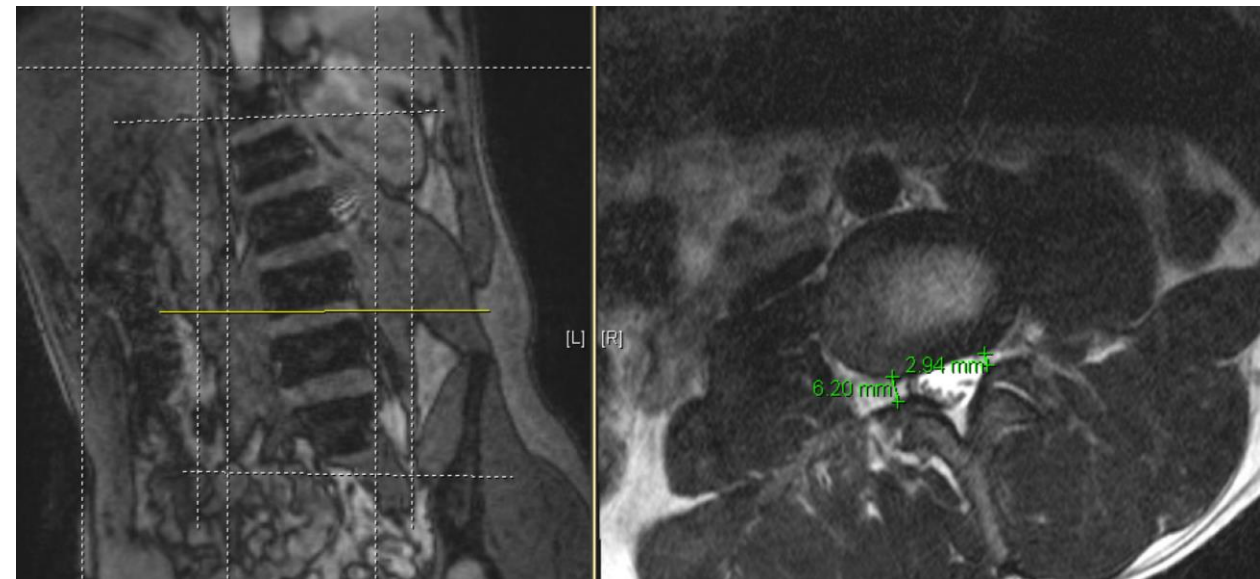
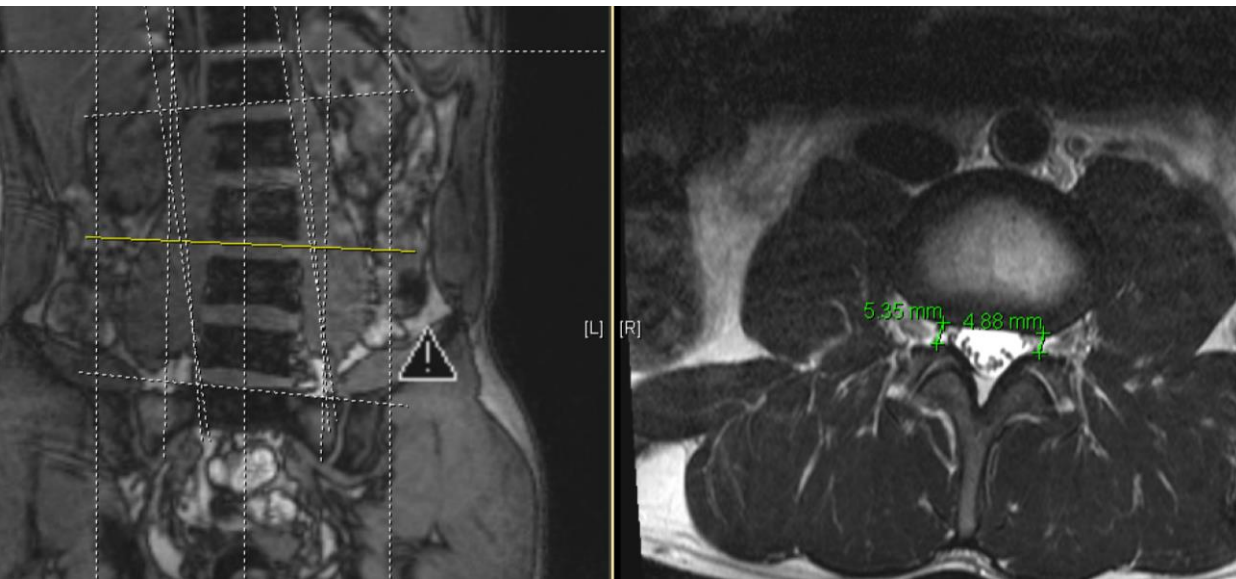
How does scoliosis affect sagittal slices?



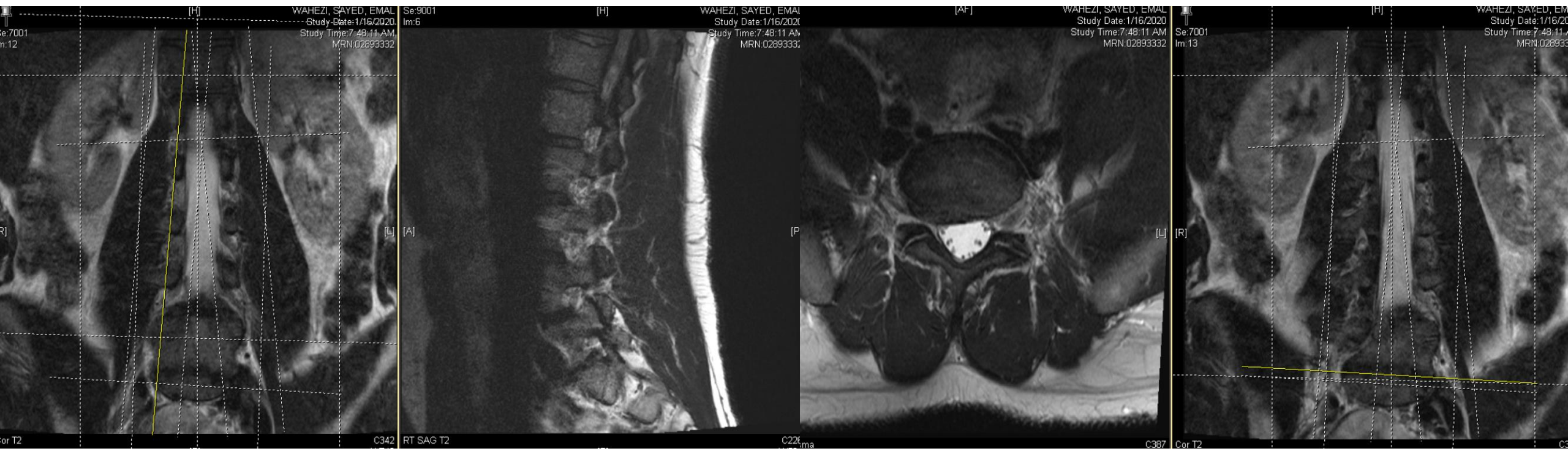
Which image accurately displays NF caliber? Why



Which image accurately displays NF caliber?



How does DDD and mild scoliosis impact NF analysis?





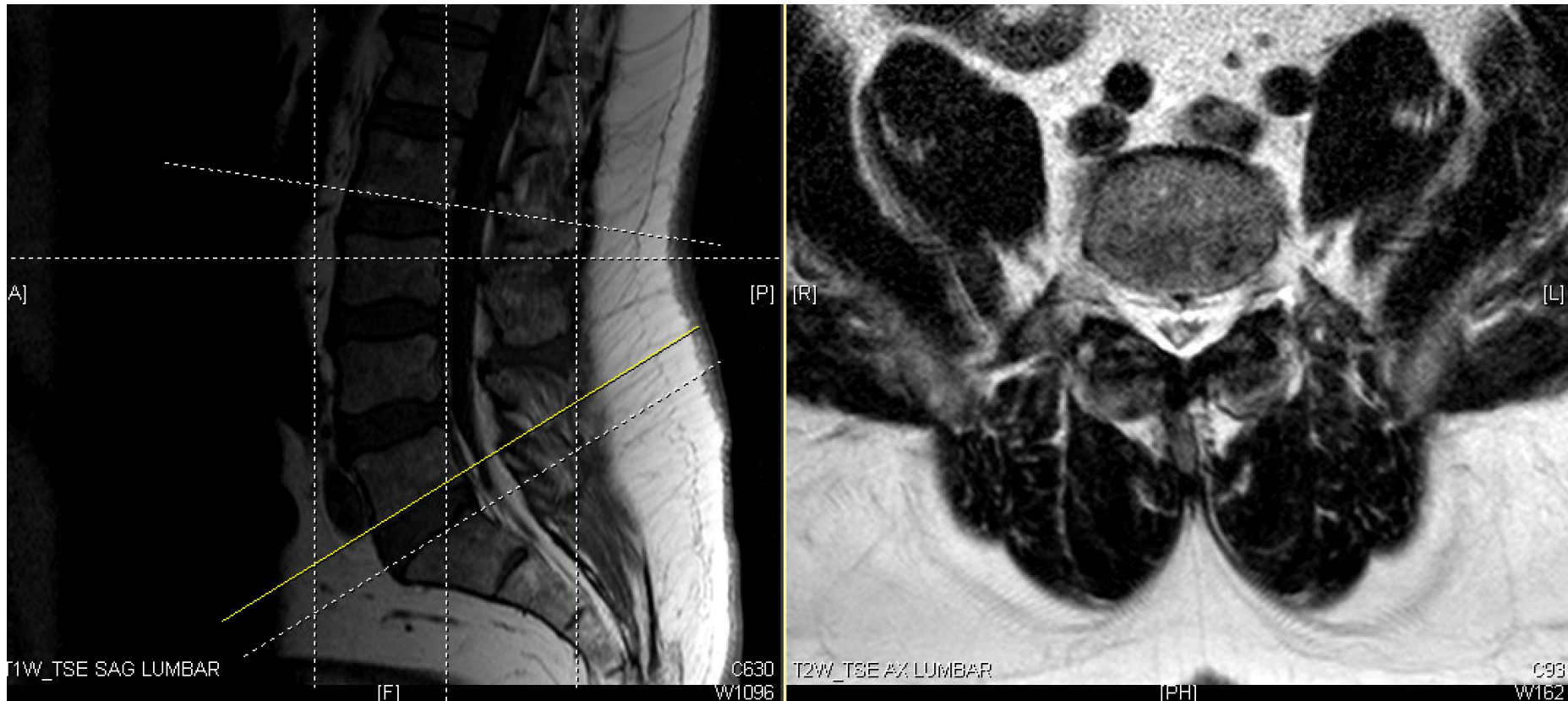
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- T1 displays high fat:CSF signal at the L5 level
- T2 axial displays minimal CSF signal in thecal sac





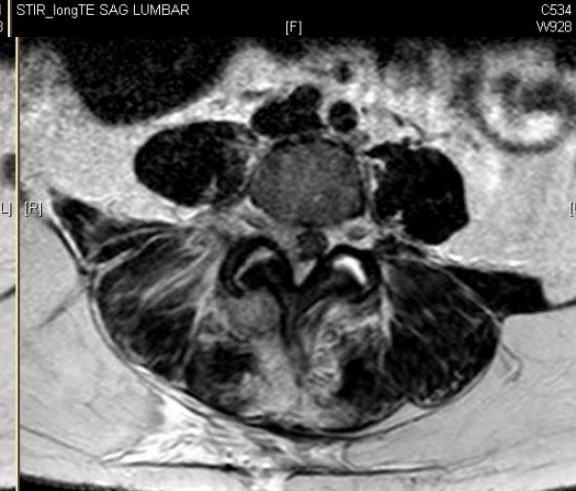
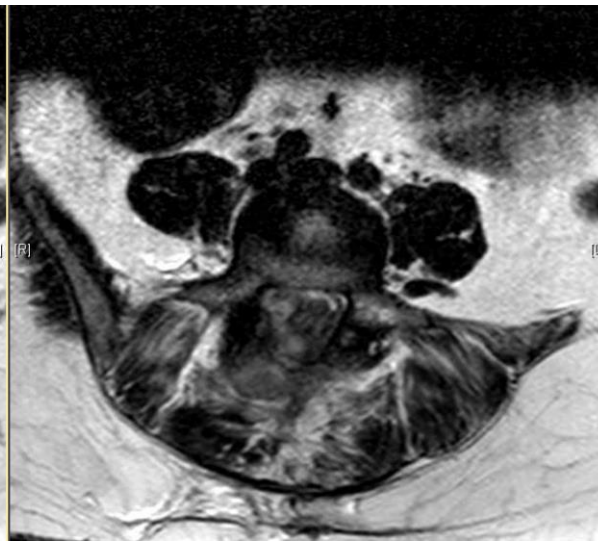
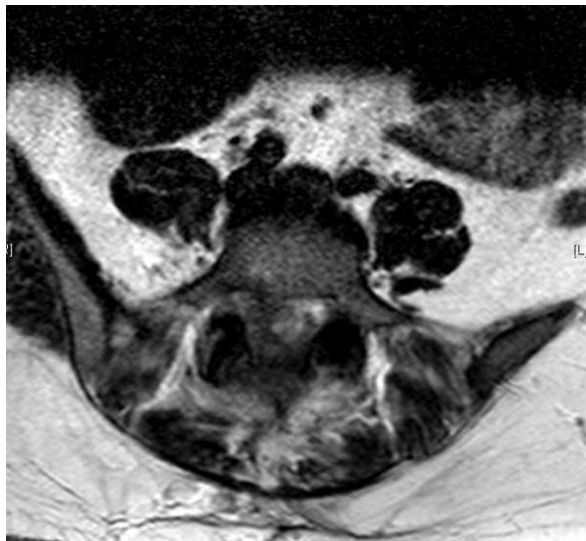
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- Fluid collection at R side of canal at L45





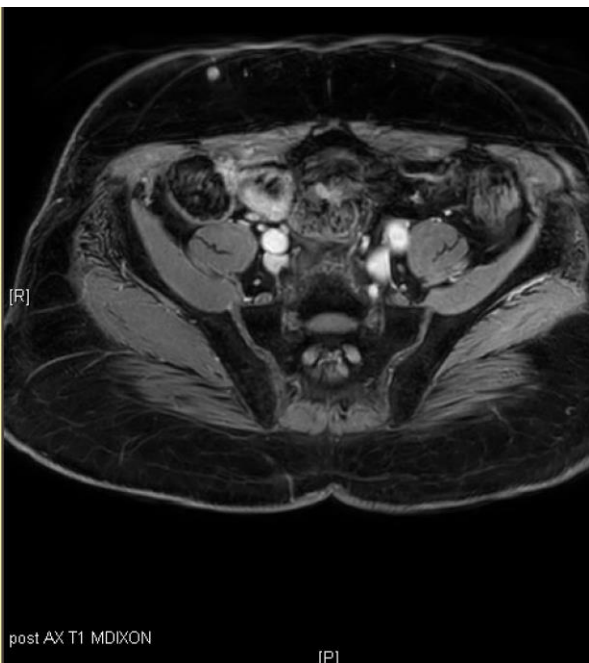
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- Fat suppression demonstrates increased signal at iliopsoas





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- CT demonstrates pathology not clearly identified on MRI





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- End