AMSER Case of the Month: April 2019

51 y/o M with low back pain and left lower extremity radicular pain

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Patient Presentation

- HPI: 51 y/o M Jehovah's Witness with history of MRSA osteomyelitis of spine & epidural abscess presents with 1 week of progressive lower back pain, left lower extremity radicular pain, and fever. Pain now limits ambulation and is worse with flexion/extension of spine. Denies IVDA.

- PMH:
  - 5 months prior: History of L5-S1 discitis/osteomyelitis, left SI joint septic arthritis, left iliopsoas abscess treated with 6 weeks IV daptomycin
  - 11 months prior: History of T9-L5 lumbar epidural abscess and left iliopsoas abscess treated with 8 weeks IV vancomycin followed by 4 weeks PO Bactrim
  - 1980s: Hepatitis C
- PSH:
  - 11 months prior: T10-L5 hemi-laminectomy & laminotomy with evacuation of epidural abscess

Patient Exam

- Motor
  - limited by pain 4/5 in lower extremity bilaterally, worse in left leg
  - able to ambulate
- Sensation
  - grossly intact symmetrically with decreased sensation in left S1 dermatome

Pertinent Labs

- WBC: 10.87
- ESR: >130
- CRP: 19.1
- Blood culture: gram-positive cocci in clusters (MRSA)

What Imaging Should We Order?

ACR Appropriateness Criteria:

Clinical Condition: Low Back Pain

Variant 5: Low back pain or radiculopathy. New or progressing symptoms or clinical findings with history of prior lumbar surgery.

Radiologic Procedure	Rating	Comments	RRL*
MRI lumbar spine without and with IV contrast	8	This procedure can differentiate disc from scar.	O
CT lumbar spine with IV contrast	6	This is most useful in postfusion patients or when MRI is contraindicated or indeterminate.	☢☢☢
CT lumbar spine without IV contrast	6	This is most useful in postfusion patients or when MRI is contraindicated or indeterminate.	☢☢☢
MRI lumbar spine without IV contrast	6	Contrast is often necessary.	O
CT myelography lumbar spine	5		☢☢☢☢
X-ray lumbar spine	5	Flexion and extension views can be useful.	☢☢☢
Tc-99m bone scan with SPECT spine	5	This procedure helps detect and localize painful pseudarthrosis. SPECT/CT can be useful for anatomic localization and problem solving.	☢☢☢
Discography and post-discography CT lumbar spine	5		☢☢☢
CT lumbar spine without and with IV contrast	3		☢☢☢☢

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

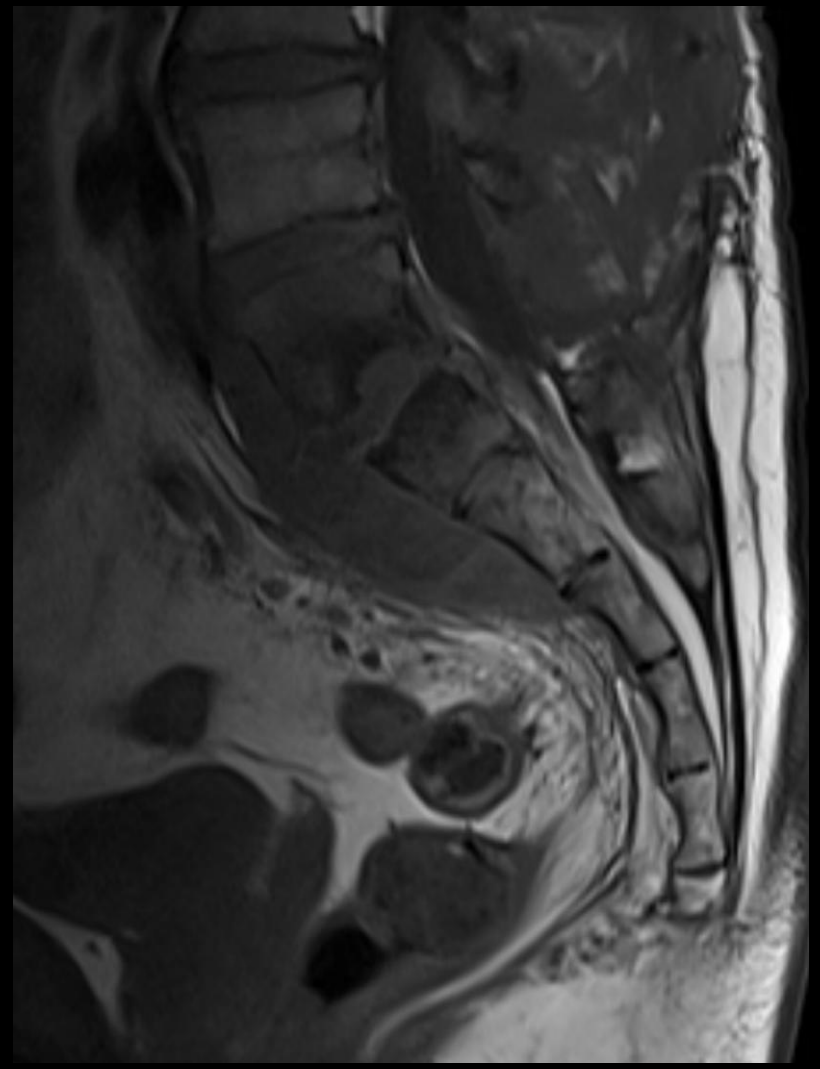
*Relative Radiation Level

This imaging modality was ordered

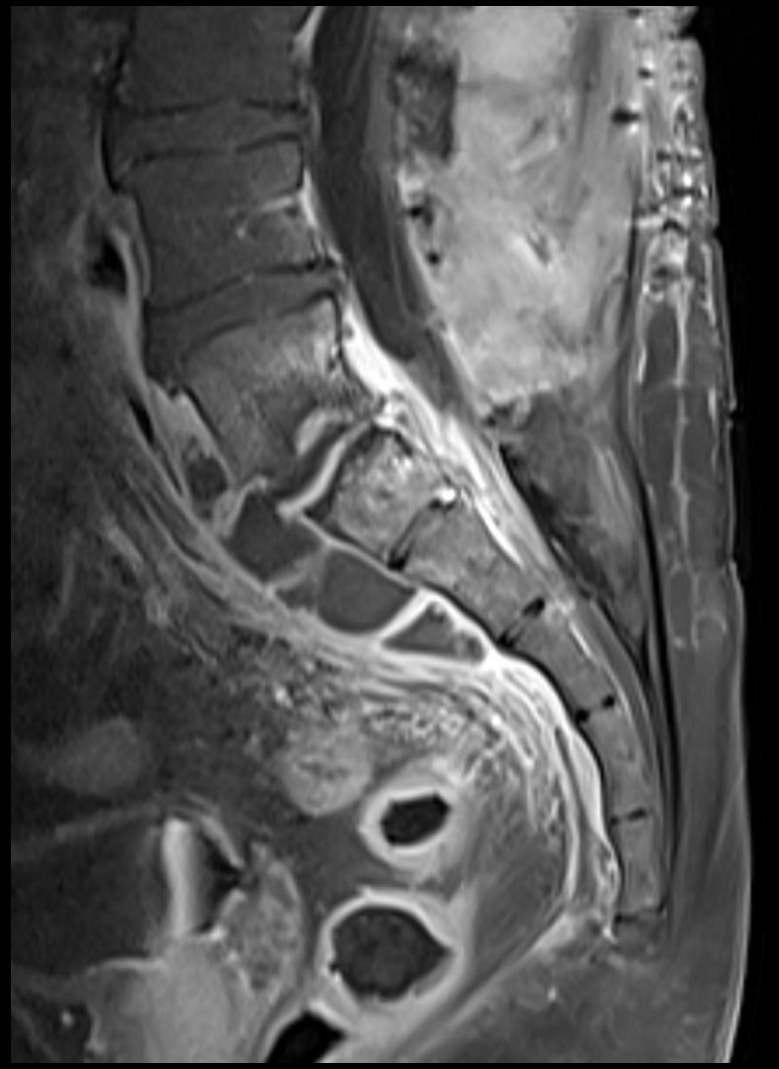
MRI

Sagittal STIR

Sagittal T1 pre-contrast



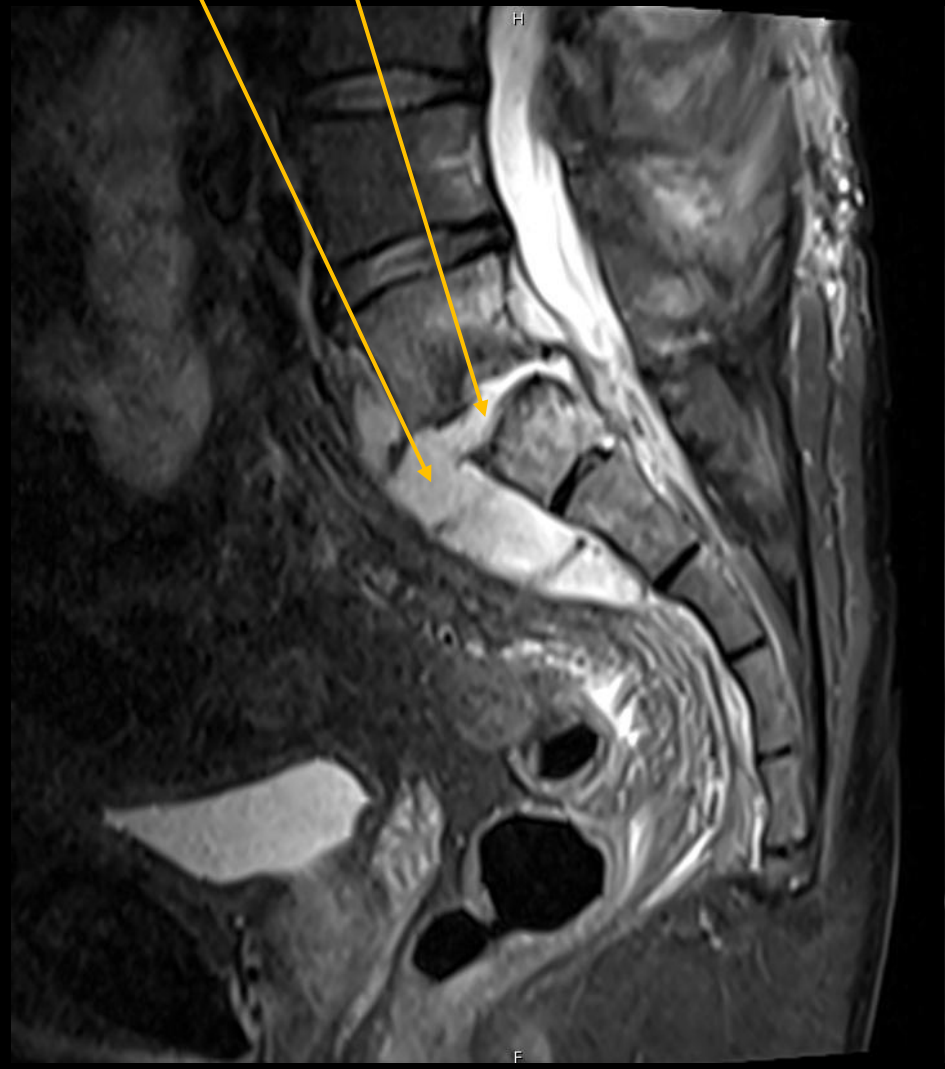
Sagittal T1 FS post-contrast



MRI Findings (Labeled)

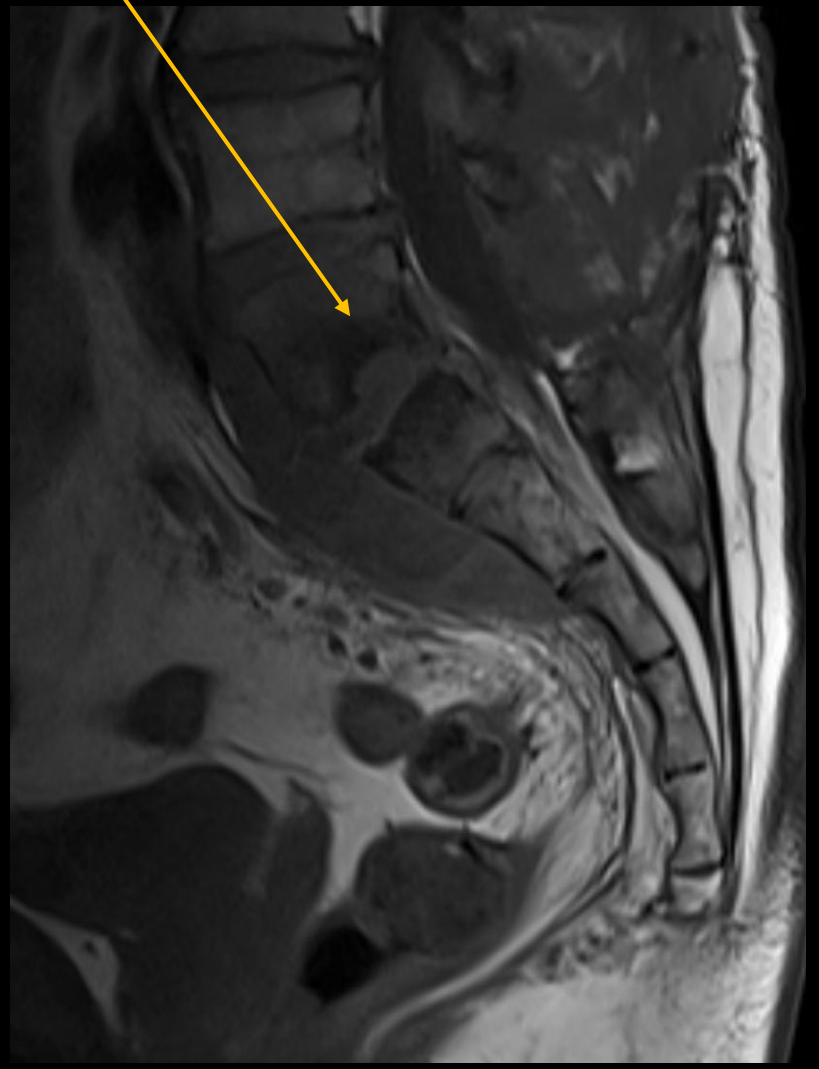
Hyperintense disc and presacral collection

Sagittal STIR



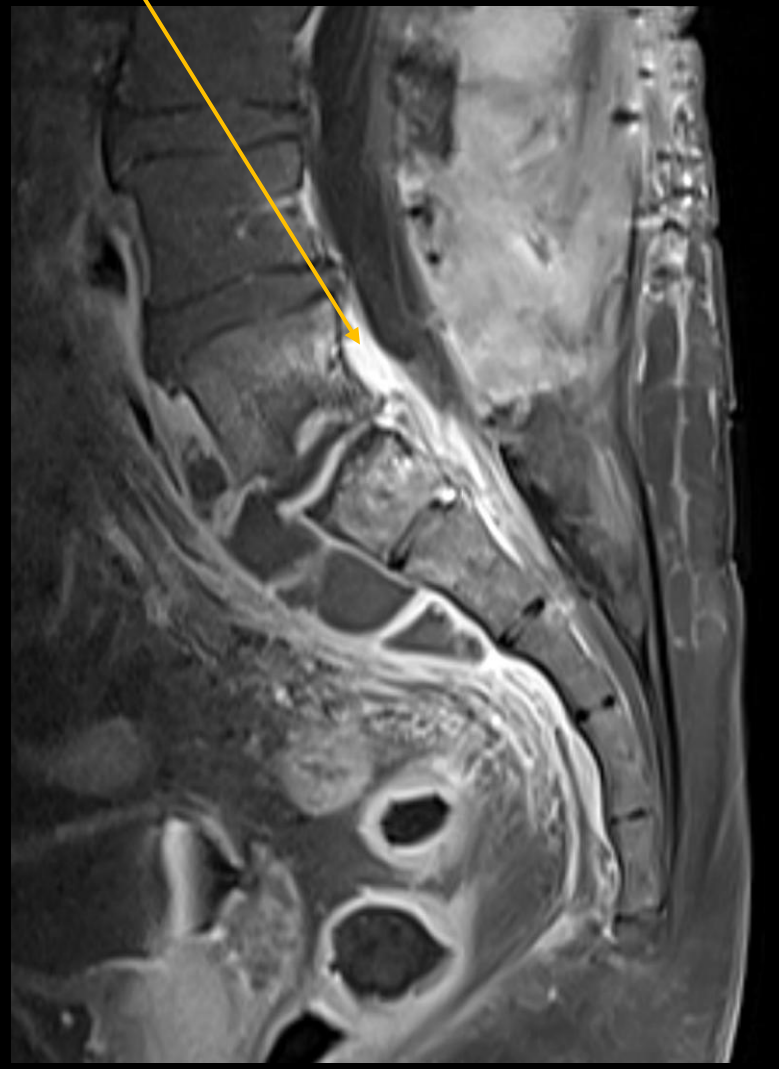
Hypointense T1 signal and endplate destruction

Sagittal T1 pre-contrast



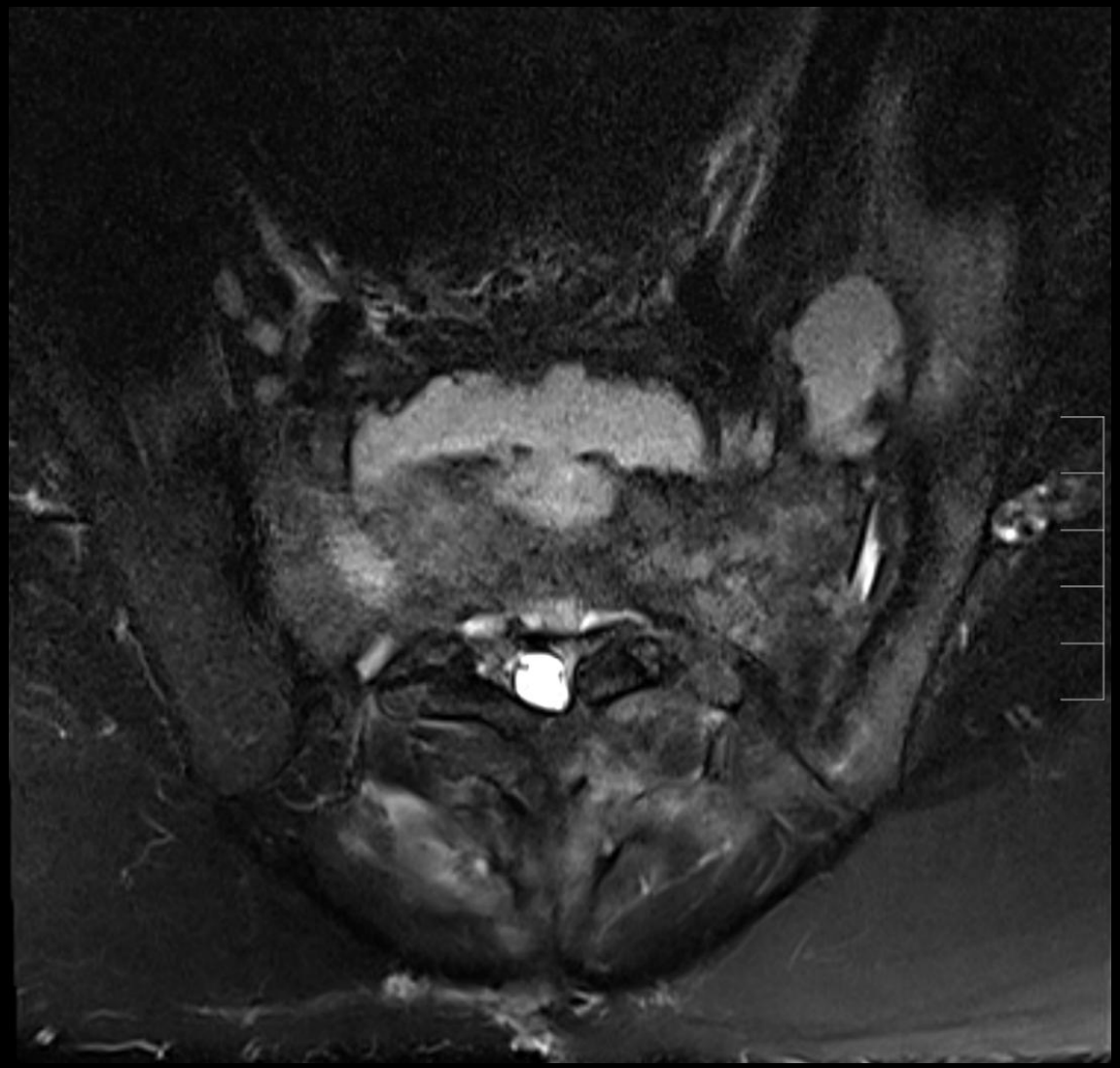
Enhancing epidural collection

Sagittal T1 FS post-contrast

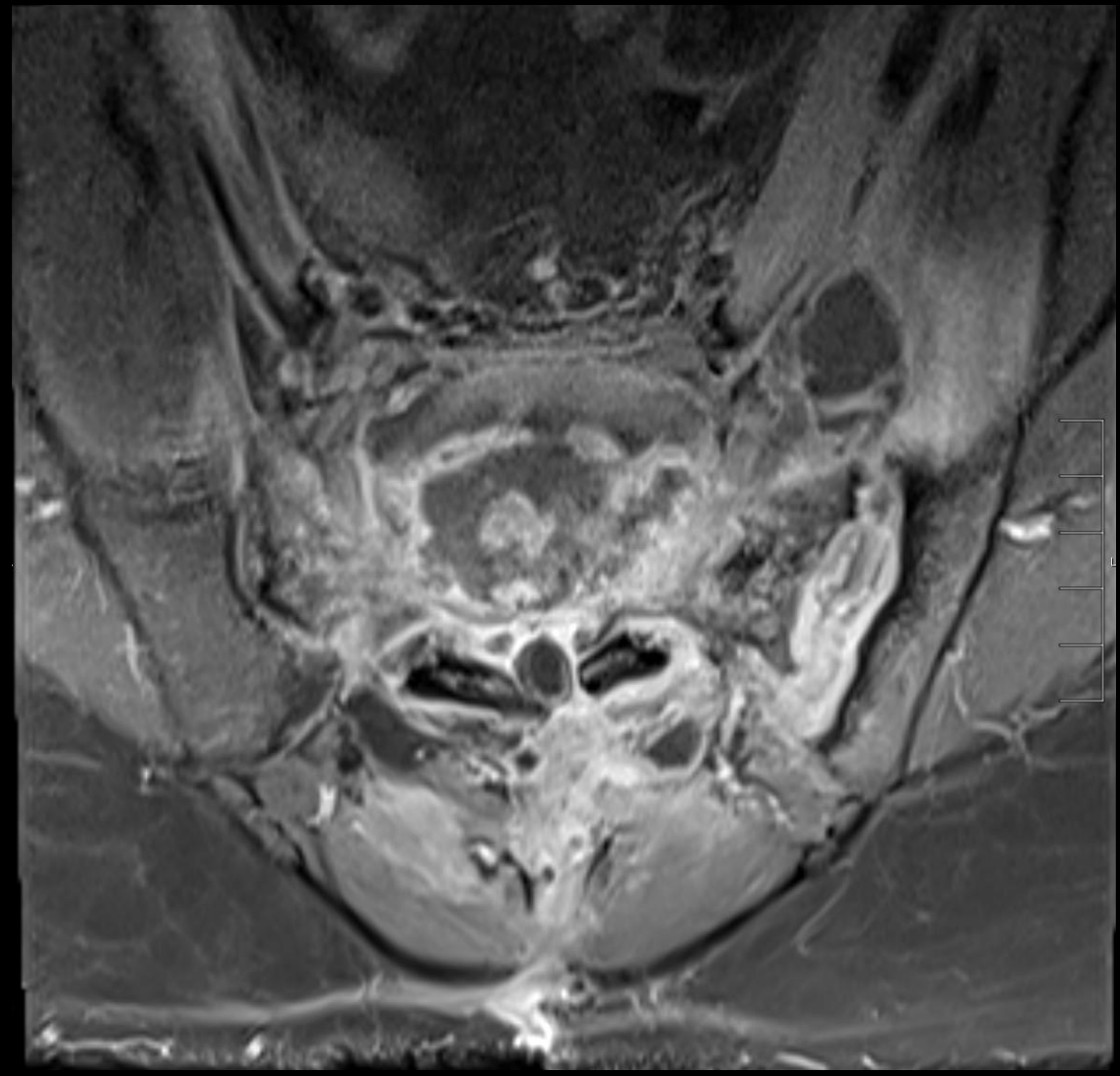


MRI

Axial T2 (S1-S2)



Axial T1 FS post-contrast (S1-S2)



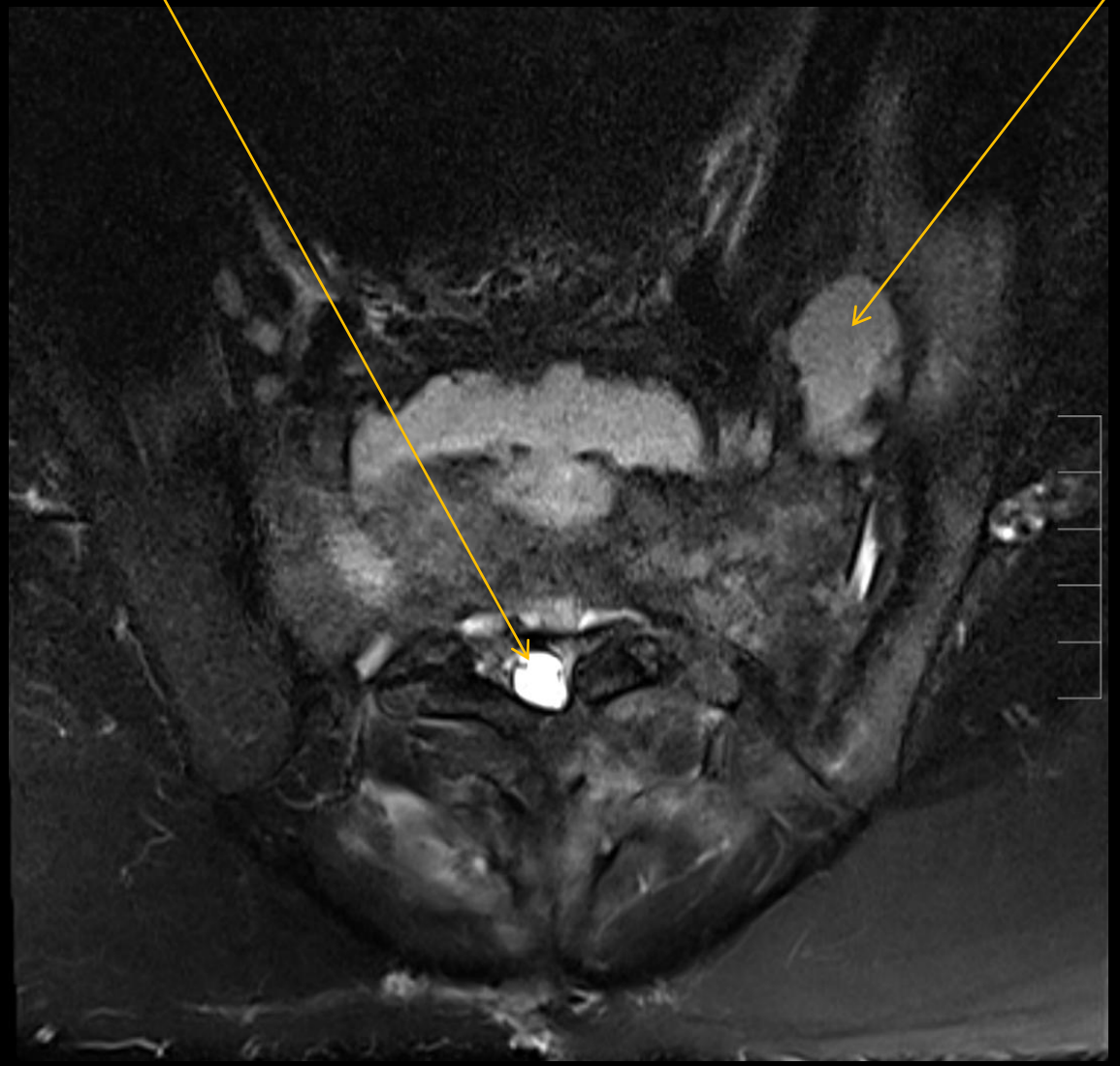
MRI Findings(labeled)

Spinal canal narrowing due to ventral epidural collection

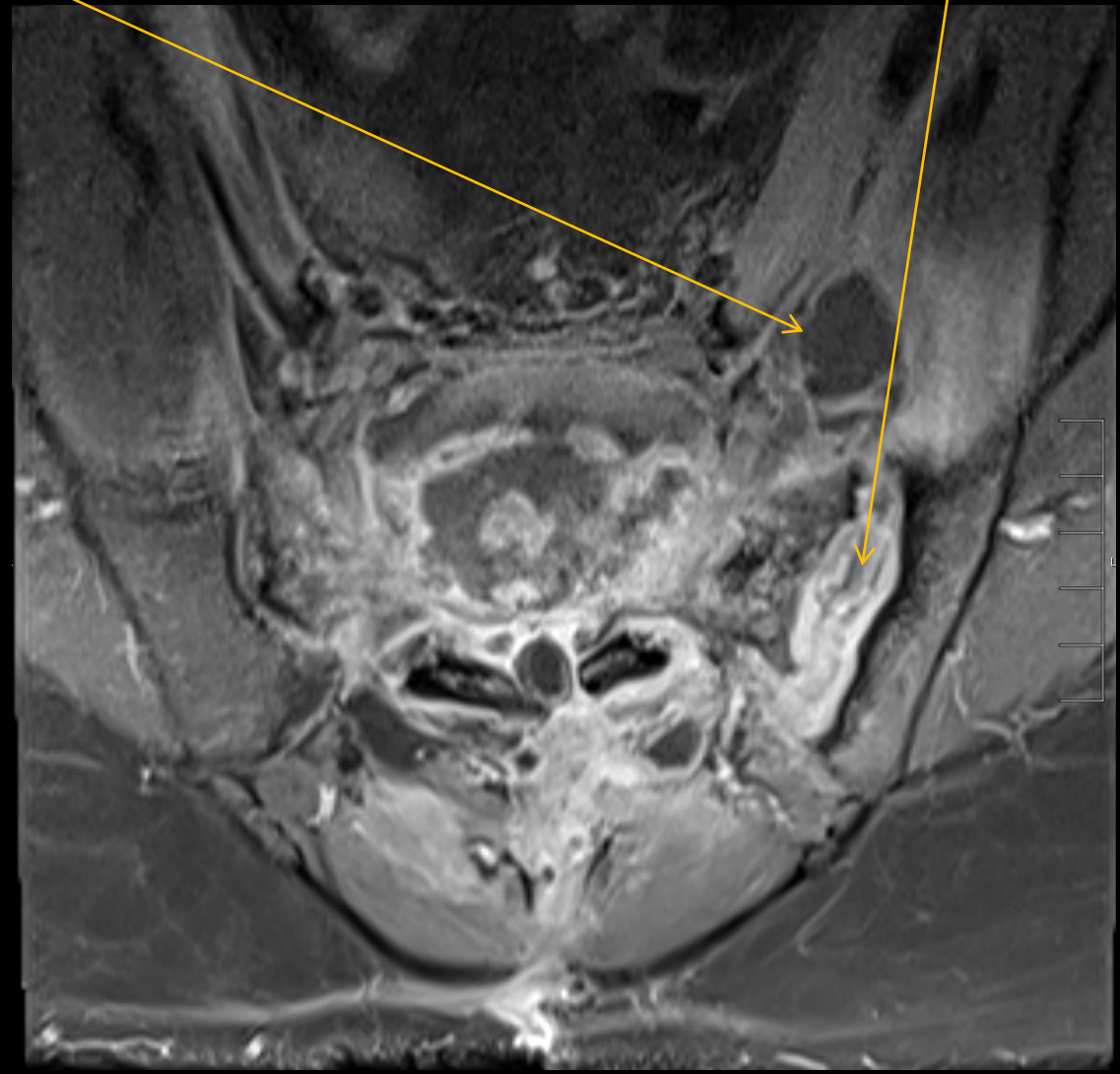
T2 hyperintense, rim enhancing collection extending from SI joint

Bone destruction and enhancement of left SI joint

Axial T2 (S1-S2)



Axial T1 FS post-contrast (S1-S2)



Final Diagnosis

Discitis/osteomyelitis at S1-S2 with epidural phlegmon/abscess and presacral abscess

Septic arthritis-osteomyelitis involving the left sacroiliac joint with retroperitoneal abscess

Patient ultimately refused surgical intervention and was placed on 8 week course IV vancomycin

Discitis / Osteomyelitis

- Infection of bone characterized by progressive inflammatory destruction and apposition of new bone
- Occurs primarily in adults >50 y/o, incidence increases with age
  - More common in men (2:1)
  - Associated with: septic arthritis, abscess
- Risk factors: IVDA, trauma, prior spinal surgery, degenerative spine disease, infective endocarditis, diabetes, chronic corticosteroid use, immunocompromised, sickle cell
- Microbiology: *Staph aureus* most common organism (>50%)
  - Other common bugs: gram-negative organisms from GU infection or URI, *Pseudomonas* (IVDA), *Salmonella* (sickle cell), TB

Discitis / Osteomyelitis

- Mechanism: hematogenous spread (most common), contiguous spread, direct inoculation
- Clinical features: localized pain over affected disc(s) progressively worsening over weeks/months, radicular symptoms if extends posteriorly into epidural space, fever not consistently seen
- Labs: >80% have increased CRP and ESR (can exceed 100)
- Dx: positive culture from biopsy
  - Can also be inferred from clinical and radiographic findings typical of vertebral osteomyelitis and positive blood cultures

Imaging

- MRI most sensitive for diagnosing vertebral osteomyelitis
  - Decreased signal intensity on T1-weighted in vertebral bodies and disc and loss of endplate definition
  - Increased disc signal intensity on T2-weighted; less often, increased vertebral body signal intensity
  - Contrast enhancement of the vertebral body and disc (rim enhancement of paraspinal and epidural processes correlates with abscess formation, whereas homogeneous enhancement correlates with phlegmon formation)
- CT if MRI cannot be obtained
- X-ray if MRI and CT not available, but findings typically only present after the disease has become advanced

Treatment

- Complete minimum 6 week course IV antibiotics
  - Empirically: vancomycin + (cefotaxime, ceftazidime, ceftriaxone, cefepime, or ciprofloxacin)
  - Add metronidazole only if high clinical suspicion/evidence of anaerobic infection
- Surgery if:
  - Neurologic deficits
  - Epidural or paravertebral abscesses that need to be drained
  - Threatened or actual cord compression due to vertebral collapse and/or spinal instability
  - Progression, persistence, or recurrence of disease despite appropriate antimicrobial therapy

References

- ACR Appropriateness Criteria: Low Back Pain. American College of Radiology. https://acsearch.acr.org/docs/69483/Narrative/
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- Cebrián Parra JL, Saez-Arenillas Martín A, Urda Martínez-Aedo AL, Soler Ivañez I, Agreda E, Lopez-Duran Stern L. Management of infectious discitis. Outcome in one hundred and eight patients in a university hospital. Int Orthop. 2012;36(2):239-44.

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