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:

<table>
<thead>
<tr>
<th>Clinical Condition</th>
<th>Low Back Pain</th>
<th>Variant 5: Low back pain or radiculopathy. New or progressing symptoms or clinical findings with history of prior lumbar surgery.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiologic Procedure</td>
<td>Rating</td>
<td>Comments</td>
</tr>
<tr>
<td>MRI lumbar spine without and with IV contrast</td>
<td>8</td>
<td>This procedure can differentiate disc from scar.</td>
</tr>
<tr>
<td>CT lumbar spine with IV contrast</td>
<td>6</td>
<td>This is most useful in postfusion patients or when MRI is contraindicated or indeterminate.</td>
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<tr>
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<tr>
<td>MRI lumbar spine without IV contrast</td>
<td>6</td>
<td>Contrast is often necessary.</td>
</tr>
<tr>
<td>CT myelography lumbar spine</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>X-ray lumbar spine</td>
<td>5</td>
<td>Flexion and extension views can be useful.</td>
</tr>
<tr>
<td>Tc-99m bone scan with SPECT spine</td>
<td>5</td>
<td>This procedure helps detect and localize painful pseudarthrosis. SPECT/CT can be useful for anatomic localization and problem solving.</td>
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<tr>
<td>Discography and post-discography CT lumbar spine</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CT lumbar spine without and with IV contrast</td>
<td>3</td>
<td></td>
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</tbody>
</table>

*Relative Radiation Level

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

This imaging modality was ordered.
MRI Findings (Labeled)

- Hyperintense disc and presacral collection
- Hypointense T1 signal and endplate destruction
- Enhancing epidural collection

Sagittal STIR
Sagittal T1 pre-contrast
Sagittal T1 FS post-contrast
MRI Findings (labeled)

- Spinal canal narrowing due to ventral epidural collection
- Axial T2 (S1-S2)
- T2 hyperintense, rim enhancing collection extending from SI joint
- Bone destruction and enhancement of left SI joint
- 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


• Orthobullets. Osteomyelitis – Adults. https://www.orthobullets.com/trauma/1057/osteomyelitis--adult