emDocs

The EM Educator Series

The EM Educator Series: Sneaky Back Pain

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Case: A 33-year-old male presents with fever and back pain. He has a history of intravenous drug use. His symptoms started 1 week ago with back pain, but he noted fever and chills starting yesterday. He is febrile in the ED and has tenderness over T12-L3. His neurologic exam is normal, and he denies any bladder or bowel symptoms or other focal deficits.

Questions for Learners:

1. Regarding spinal epidural abscess (SEA), who is at risk, and how does it present?
2. What are the common bugs involved?
3. What is the ED evaluation, and what tests should you obtain?
4. Do labs play a role in the assessment? Who needs an emergent MRI?
5. When should antibiotics be used, and when should they be held?
6. If you use administer antibiotics, what ones in particular are recommended?

Suggested Resources:

- ✓ Articles
  - emDOCs
  - CoreEM
  - EPMonthly
  - Orthobullets
  - Taming the Sru
  - emDocs - MRI
- ✓ PubMed:
  - Internal and Emergency Medicine

Answers for Learners:

1. Regarding spinal epidural abscess (SEA), who is at risk, and how does it present?

SEA "classically" presents with spinal pain, fever, and neurologic deficit. However, this triad is present in only 10-15% of cases! With an annual incidence of three cases per 10,000 hospitalized patients with any age affected, this rare disease has potentially devastating consequences. The disease is due to collection of inflammatory material between the dura and vertebral column, often extending three to five spinal segments in the thoracic and lumbar spine. Once neurologic deficits appear, they are often irreversible. Approximately 50% of survivors will have residual neurologic deficits after treatment, including 15% with paresis or complete paralysis. The final outcome is correlated with the severity and duration of neurologic deficit before diagnosis and treatment.

These patients both have **several risk factors**, which commonly include spinal instrumentation (including epidural analgesia and paraspinal injection), diabetes mellitus, HIV, trauma, intravenous drug use, immunosuppressive therapy, contiguous soft tissue or bony infection, bacteremia, cancer, renal failure/hemodialysis, alcoholism, and tattoo over the site. These risk factors reflect the pathogenesis of SEA, as the three most common sources are contiguous infection, hematogenous spread, or iatrogenic. Approximately 30% have no source discovered on investigation. Up to 20% of patients have no risk factors!

Despite the presence of multiple risk factors in these patients, they present with different exams, as the older male possesses a completely normal exam while the younger female presents with objective right lower extremity weakness in the L4 and L5 distribution. Early symptoms are non-specific, but they can be broken into four stages: I includes back pain, fever, and tenderness (the 72 year-old male); II includes radicular pain, nuchal rigidity, reflex changes; III includes sensory abnormalities, motor weakness, bowel and bladder dysfunction (the 23 year-old female); and IV includes paralysis [12]. You cannot rely on fever, as approximately two thirds of patients will not have a fever at first presentation.

2. What are the common bugs involved?

Empiric Antibiotics: directed against Staphylococcus and Gram Negative Bacilli.

- Vancomycin (30-60 mg/kg divided into two daily doses) PLUS
- 3rd Generation Cephalosporin: Cefotaxime (2 g IV every 6 hrs), Ceftriaxone (2 g IV every 12 hours) or Ceftazidime (2 g IV every 8 hours)

3. What is the ED evaluation, and what tests should you obtain?
4. Do labs play a role in the assessment? Who needs an emergent MRI?

After your evaluation, you elect to work the patients up similarly with CBC, ESR, CRP, renal function panel, and urinalysis. These tests do not lead to a definitive diagnosis, but they can assist. ESR > 20 mm/h is found in approximately 95% of cases, but no laboratory test is specific for SEA. Thrombocytopenia (less than 100,000) and ESR above 110 mm/h predict poor outcome. Leukocytosis can be found in 66% of cases, which is insufficient for ruling out the disease. Like the old saying goes, "The CBC is the last bastion of the intellectually destitute!" Blood cultures, positive in approximately 60% of cases, can help tailor antibiotic treatment, but of course would not be available on the initial ED visit. Thus, empiric coverage is recommended. Staphylococcus aureus is the most common agent, with

MRSA and MSSA accounting for about 70% of reported cases with coagulase-negative Staph and gram negative bacilli following. Lumbar puncture is not indicated.

Ultimately, imaging with MRI is required for definitive diagnosis, with sensitivities and specificities above 90%. Ensure you order gadolinium-enhanced MRI, which allows earlier detection of abscess and prognostication, as increased morbidity exists with central cord stenosis greater than 50% and abscess length greater than 3cm. When ordering the MRI, image the entire spine! Do not just order imaging of the area where the tenderness is present. Skip lesions, or involvement of noncontiguous vertebrae, are common in patients with greater than seven days of symptoms, infection outside of the spine, or elevated ESR at presentation (> 95 mm/h). If unable to obtain the MRI, your next best bet is CT myelogram which has similar sensitivities, but this test can underestimate abscess length. CT with IV contrast is an option, but this test may not distinguish early infectious findings from other changes involving the soft tissues, discs, or vertebrae.

5. **When should antibiotics be used, and when should they be held?**
6. **If you use administer antibiotics, what ones in particular are recommended?**

Antibiotics are required for management, but they are tailored to cultures from blood and the abscess. After cultures are obtained, broad spectrum coverage should be provided including vancomycin 20 mg/kg IV, metronidazole 500 mg IV, and a third generation cephalosporin (cefotaxime 2 g IV, ceftriaxone 2 g IV, or ceftazidime 2 g IV). If the patient is hemodynamically unstable, blood cultures should be obtained and antibiotics with broad spectrum coverage provided.

There has been a recent trend towards nonoperative management as new studies shows nonoperative treatment effective in certain patients without neurologic deficit. This should only be done in conjunction with neurosurgery.