

EMERGENCY MEDICINE CASES



EPISODE 26: EMERGENCY CAUSES OF LOW BACK PAIN WITH DR. BRIAN STEINHART & DR. WALTER HIMMEL

General approach to low back pain / clinical history:

Main categories of patients with acute back pain are nonspecific lumbosacral pain/strain, radicular pain or sciatica, and emergent pathologies.

The 5 emergent pathologies are:

- 1) infection such as osteomyelitis, or spinal epidural abscess,
- 2) fracture (trauma or pathologic),
- 3) disk herniation & cord compression,
- 4) cancer in spine causing cord compression,

5) vascular - leaking/ruptured AAA, retroperitoneal bleed, and spinal epidural hematoma.

Red flags for serious pathology:

- 1) Age <18 or >60,
- 2) Symptoms or history of cancer,
- 3) Immunodeficiency (including diabetes, IVDU), previous spinal interventions, or recent infections,
- 4) Pain not resolved by analgesia,

- 5) History of trauma or coagulopathy,
- 6) Cauda equina/cord compression symptoms (bowel, bladder or erectile dysfunction, saddle paresthesia, progressive bilateral leg weakness)

Pearls: *Constant, unrelenting, severe pain, especially if it is worse lying down is a red flag for infection or cancer.* Discogenic pain is worse with flexion, and spain from spondylolysis is worse with extension.

SPINAL EPIDURAL ABSCESS: PEARLS AND PITFALLS

Spinal epidural abscess is rare (1-2/10,000 of hospitalized patients). The classic triad of fever, back pain, and neurologic deficit is present in only 15% of patients, depending on stage of disease. Spinal epidural abscess is often missed on first ED visit. Fever is present in only 50% of patients, and neuro deficits start very subtly. **Risk Factors:** Diabetes, IVDU, indwelling catheters, spinal interventions, infections elsewhere (especially skin), immune suppression (i.e. HIV), and "repeat ED visits."



A challenge in the ED?

Upwards of 90% of low back pain presentations in the ED are due to benign causes. However there are several important life/limb-threatening diagnoses we must consider in the low back pain patient, and most of these diagnoses are easy to miss. Furthermore, lumbosacral sprain is often associated with significant morbidity, and ED docs should provide specific education and evidence based treatments (see page 3).

Physical exam, imaging tests, & pearls for diagnosis

Physical Exam Maneuvers:

- 1) **Percuss** the spinous processes for tenderness, a red flag for infection and fracture,
- 2) Test for **saddle anesthesia** (sensation changes may be subtle and subjective), (1)
- 3) **DRE** looking for tone/sensation,
- 4) Look for fever, or **signs of infection**,
- 5) Check carefully for bilateral, or multi-level neurologic findings in lower extremities, and assess for gait disturbances.

Straight leg raise (SLR):

Non-specific test, only positive pain is produced distal to the knee between 30–70°. Pain with contralateral SLR is more specific for sciatica.

Slump test: Helps discriminate radicular pain from hamstring pain. With thoracic and cervical flexion, and knee in extension, dorsiflex the foot and flex the neck to determine if pain is produced, with release of cervical flexion to see if symptoms improve (image below).



Abdomen exam and ED ultrasound: look for AAA and bladder distention post-void.

EPIDURAL ABSCESS

Suspect epidural abscess in a patient with:

- a) back pain or neurologic deficits and fever, or
- b) back pain in an immune-compromised patient, or
- c) patient with a recent spinal procedure and either of the above.

CRP and ESR may help, depending on the clinical suspicion for epidural abscess. If suspicion is low after the history and physical, low ESR and CRP levels support *not* doing an MRI, and discharging the patient home with *close follow up*. If there is a high index of suspicion, an MRI is indicated *regardless of CRP and ESR*.

Remember the normal ESR cutoff is: $(age + 10) / 2$.

In one study of epidural abscesses, 98% had ESR >20, and most were much higher (>60) (2).

Is there any role for CT scan? CT cannot rule out epidural abscess because it does not show the epidural space, spinal cord, or spinal nerves. CT can lead to the pitfall diagnosis of osteomyelitis, missing coexistent abscess (and the urgent indication for surgery).

Remember if the suspicion is epidural abscess, the entire spine must be imaged by MRI. Spinal cord obstruction and paralysis can happen very quickly from epidural abscess, so there needs to be definitive imaging and

surgical decompression as quickly as possible.

Start antibiotics while awaiting definitive diagnosis: include appropriate coverage for MSSA and MRSA, *and* cover gram negatives.

CAUDA EQUINA SYNDROME

Definition:

1) urinary retention or rectal dysfunction or sexual dysfunction (or all of the above)

PLUS

2) saddle or anal anesthesia and/or hypoesthesia (1).

Urinary retention is non-specific for spinal cord compression, but sensitive. Post void residual <100cc has a very high NPV to rule out cauda equina syndrome.

When are steroids indicated:

Evidence supports dexamethasone for metastasis to spine causing cauda equina. There is no indication for IV steroids for patients with cord compression by other causes.

COGNITIVE FORCING STRATEGY TO REMEMBER SERIOUS PATHOLOGIES:

Considering renal colic?
think about AAA!

Considering pyelonephritis?
think about spinal infection!



SPINAL METASTASES

Known cancer + new back pain = spinal metastases until proven otherwise!

Time is Limbs: Spinal metastases are one of the most common causes of cord compression. Pre-treatment neuro status predicts outcome for this emergency.

Workup:

- 1) X-ray to look for compression #, soft tissue changes, blastic/lytic lesions, pedicle erosion (see image below)
- 2) Consider testing ESR and CRP, and calcium profile if signs are consistent with hypercalcemia (e.g. polyurea)
- 3) Give **dexamethasone** as soon as mets are suspected (at least 10mg IV) if the patient has neurologic symptoms. Consider bisphosphonate* and calcitonin if patient is hypercalcemic, or if you suspect compression # or bony metastasis.
- 4) Get an urgent MRI if there are symptoms of cord compression. If there are hard neurologic findings, MRI is needed within 24 hours. If the x-ray findings are consistent with mets, but there are no neuro findings, an MRI should be done within 7 days.

**Bisphosphonates may decrease bone resorption in patients with metastatic disease to the bone, and relieve pain better than placebo. (3)*



Hematogenous spread from metastatic disease often settles in end arterioles in the pedicles. Lytic lesions there present with pedicle destruction, visible on the lumbar spine x-

ray as a **winking owl sign** (arrow) where the pedicle, or “owl eye,” is lost.

VASCULAR EMERGENCIES

Spinal Epidural Hematoma

Spinal epidural hematoma may present after spinal procedures (epidural anesthesia), but can be spontaneous, especially in anti-coagulated patients. Neurologic findings depend on the extent of spinal cord compression—from isolated pain to flaccid paralysis. Suspect this emergency in patients with a history of trauma and neurologic findings who are coagulopathic.

Abdominal Aortic Aneurysm

Typical manifestations of rupture of a AAA is abdominal or back pain, with a pulsatile mass in a patient with a history of HTN. However, symptoms may range from dizziness, syncope, groin pain, or flank mass to presentation with paralysis. Look for *livedo reticularis* (atheroemboli to feet) and signs of poor circulation in the lower extremities.

Transient hypotension or syncope after onset of pain is an important clue for bleeding from a ruptured AAA. Patients may present in shock, and quickly decline. Do an ED ultrasound right away as an extension of the physical exam to rule out AAA in patients with low back pain and hypotension.

Retroperitoneal Bleed (RPB)

Patients with coagulopathies, as well as patients with retroperitoneal masses or tumors, or abdominal/pelvic trauma are at risk. Blood may dissect anteriorly, causing abdominal pain, or may cause pain to the hip, groin, or anterior thigh.

On the physical exam, look for psoas sign caused by retroperitoneal irritation, femoral neuropathy and hip pain, as well as Cullen's/Turner's signs, or bruising or swelling in the groin caused by extension of bleeding into the skin.

LUMBOSACRAL / MECHANICAL PAIN

Making the Diagnosis:

Lumbosacral sprain or mechanical back pain is a diagnosis of exclusion, made only after carefully ruling out serious causes of low back pain.

Management:

- 1) **Education** This is a mechanical problem requiring a mechanical solution - and pain medications alone will not fix the problem. Patients need to play an active role in their recovery, and prolonged bed rest will worsen the problem.
- 2) **Reassurance** 90% get better with time (over weeks)
- 3) **Symptom Management** Evidence from the Cochrane collaboration (4) supports heat, NSAIDs, acetaminophen, massage and physical therapy. Muscle relaxants may be as effective as NSAIDs, but they have significant side effects, especially in combination with opioids.

References:

- 1) Lavy, C et al. BMJ. 2009;338:b926.
- 2) Davis, D et al. J Neurosurg Spine. 2011;14:765-70
- 3) Armingeat, T et al. Osteoporos Int. 2006;17:1659-65.
- 4) <http://back.cochrane.org/our-reviews>



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