

The EM Educator Series

The EM Educator Series: My Patient with Unilateral Leg Weakness

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Case 1:

A 41-year-old female with a history of obesity and chronic back pain presents with worsening back pain and bilateral sciatica. Upon further questioning, she states her urine output is “different”, and she has been unable to feel when she wipes were perineal area with toilet paper.

Case 2:

A 52-year-old male presents with worsening back pain. He states he has noticed issues with erectile dysfunction within the past 48 hours. He has not noted any changes in urine or bowel function. On neurological exam, he has bilateral weakness with L5 function.

Questions for Learners:

1. What are the emergent causes of low back pain?
2. What other systems besides musculoskeletal can cause back pain?
3. What are key components of the history in patients presenting with back pain?
4. What comprises a complete neurological exam for a patient with back pain?
5. How can cauda equina present?
6. How should you evaluate for cauda equina syndrome, including ED testing?
7. What is the management of cauda equina syndrome?
8. What imaging does my back pain patient need?

Suggested Resources:

- Articles:
 - [emDocs – Cauda Equina Syndrome](#)
 - [Emergency Medicine Cases](#)
 - [REBEL EM](#)
 - [Ortho Bullets](#)
 - [WikEM](#)
- PMID:
 - [American Journal of Emergency Medicine](#)
 - [American College of Radiology Imaging](#)

Answers for Learners:

1. What are the emergent causes of low back pain?
2. What other systems besides musculoskeletal can cause back pain?

Main categories of patients with acute back pain:

- nonspecific lumbosacral pain/strain
- radicular pain or sciatica
- 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.

3. What are key components of the history in patients presenting with back pain?

Red flags for Low Back Pain Emergencies

1. Age 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 pain from spondylolysis is worse with extension



Update 2018: While positive responses to “red flag” questions for low back pain (e.g. bowel or bladder incontinence, history of cancer, trauma, fever, IV drug use etc) prompt further investigation, negative responses are not sufficient to rule out serious pathology. Though conclusions were based on a large retrospective review, the authors present data recommending caution when using “red flag” questions as screening tools.

4. What comprises a complete neurological exam for a patient with back pain?

For many patients, palpation and provocative tests are enough to confirm a musculoskeletal cause. Conservative treatment is then prescribed. However, if your patient has severe or prolonged pain or if there is any concern from the history about neurological dysfunction a neurological exam should be conducted.

The neurological exam consists of the:

- 1) Motor Exam
- 2) Sensory Exam
- 3) Reflex Exam

Of note, the major nerve roots to examine include L4, L5 and S1 as they are the most commonly affected. Therefore, we will focus on these three roots as well for each neurological exam.

5. How can cauda equina present?

Definition of Cauda Equina Syndrome:

1. urinary retention or rectal dysfunction or sexual dysfunction (or all of the above)
PLUS
 2. saddle or anal anesthesia and/or hypoesthesia.
- Urinary retention is non-specific for cauda equina syndrome, but sensitive.
 - A post void residual >100mL should raise the suspicion for cauda equina syndrome

The *cauda equina syndrome* (CES) is a serious pathologic condition that is caused by compression of these nerve roots. It can cause various symptoms such as back pain, sciatica, motor weakness, and sensory deficits, but the term cauda equina syndrome is used only when **bladder, bowel, and/or sexual dysfunction, and/or saddle anesthesia** occur. Some patients may go on to develop **permanent weakness, sensory deficits, and incontinence**.

6. How should you evaluate for cauda equina syndrome, including ED testing?

The bottom line is to keep a **high level of suspicion and do a full sensory and rectal exam** on any patient who may present with concerning symptoms of CES. The diagnosis **cannot be confirmed by history and examination alone, so consider imaging strongly**.

- Imaging
 - Bladder US
 - Normal post-void residual (PVR) < 50 ml (may be up to 100 ml in patients > 65 years)
 - $PVR = 0.5 \times AP \text{ diameter} \times \text{lateral diameter} \times \text{sagittal diameter}$ of the bladder
 - Plain X-rays and CT scans can show bone and soft tissue abnormalities but not spinal cord abnormalities
 - CT Myelogram
 - Allows for visualization of the spinal cord and associated abnormalities
 - Requires spinal tap followed by injection of contrast. This limits it's utility
 - Can be used for patients who have contraindications for MRI or when MRI unavailable
 - MRI
 - Imaging modality of choice for cauda equine syndrome
 - Image types: Obtain sagittal and axial T1 and T2 sequences

7. What is the management of cauda equina syndrome?

Neurosurgical or orthopedic consultation for emergency surgery

- Surgery should be performed within 24 hours to increase the chance of better outcomes (Todd 2005)
- The presence of urinary retention/incontinence at presentation is a predictor of poor outcomes

8. What imaging does my back pain patient need?

Most people with back pain do not require imaging (XR, CT, MRI) with many feeling better in about a month, whether or not they have an imaging test. Red flag symptoms usually require urgent.

"Red Flag" Symptoms in Back Pain = TUNA FISH
T = Trauma
U = Unexplained Weight Loss
N = Neurologic Symptoms
A = Age > 50
F = Fever
I = IVDU
S = Steroid Use
H = History of Cancer (Prostate, Renal, Breast, Lung)

