**A case of mechanical back pain**

* **Chief complaint**
  + 57-year-old female presents with right flank pain
* **Vital signs**
  + HR: 79 BP: 146/71 RR: 15 T: 37 °C Sat: 99% on RA Wt: 110 kg
* **What does the patient look like?**
  + Patient is limping around the examination room, uncomfortable appearing
* **Primary survey**
  + Airway: speaking normally
  + Breathing: no respiratory distress, clear lungs
  + Circulation: warm skin, 2+ distal pulses
* **Action**
  + Place patient on the monitor
  + POC glucose (93, if ordered)
* **History**
  + Source: Patient
  + HPI: A 57 year old male presents with 3 days of lumbar back pain. The patient states he has had back pain for years but this is much worse. He denies trauma or injuries. He normally takes his norco for this but they arent working anymore. He states the pain is shooting into his left leg at times. He denies weakness. Also denies any difficulty urinating or moving his bowels. He denies other symptoms
  + PMHx: HTN, DM
  + PSHx: Microdiscectomy
  + Allergies: none
  + Meds: Meloxicam, Norco, Lisinopril, Metformin
  + Social: Smokes ½ PPD
  + FHx: non-contributory
  + PCP: Dr. John Smith
* **Physical Exam**
  + General: appears uncomfortable, standing next to stretcher
  + HEENT: normal
  + Lungs: normal
  + Heart: tachycardic rate and regular rhythm
  + Abdomen: normal
  + Pelvic: normal
  + Extremities: normal
  + **Back**: No abnormalities grossly upon inspection. moderate bilateral paraspinal tenderness which is non-focal in the lumbar spine. No midline tenderness or step-offs. Patient is unable to sit down. Patient is able to flex hips to 90 bilaterally but exam is otherwise limited due pain. Sensation is intact to light touch. Unable to assess reflexes and special tests due to pain and inability to sit.
  + Neuro: normal
  + Skin: very warm and dry, several tattoos on exposed skin

**Instructor**: Prompt differential diagnosis

**Actions**

* Discuss red flags
* Treat patient
  + First line treatment should include non-opiate analgesia
  + Strongly consider muscle relaxant
* Discuss role of imaging, labs
  + Atraumatic, in absence of red flags

**Nurse**

* Nurse returns to you stating the patient has not had much relief

**Actions**

* Re-evaluate patient
* Provide additional analgesia. Consider PO or parental narcotics
* Discuss outpatient plan
  + Physical therapy/ home exercises
  + Primary care follow up or ortho/spine
  + Explain to patient need

**Diagnosis**

* Mechanical back pain with radicular features

**Critical Actions**

* Exclude red flag diagnoses and non-MSK causes
* Address patients pain in the ED
* Determine the lack of need for imaging, labs
* Develop a plan for follow up

**Instructor Guide**

* This is a case of uncomplicated mechanical back pain. The patient presented with worsening back pain with some radicular features but an intact neurological exam. The trainee should consider red flags and exclude the need to work up non-musculoskeletal causes of back pain. The role of imaging in atraumatic back pain should be addressed. The patient's pain should be addressed. The trainee should have an outpatient plan for follow up.

**Case Teaching Points: Imaging for atraumatic back pain**

* Imaging generally not indicated in the absence of red flags
* Neurological
  + Saddle anesthesia
  + Bowel or bladder dysfunction
* B symptoms
  + Unexplained weight loss
  + Fevers, chills
  + Night sweats
* History of violent trauma
* History of cancer or immunocompromised state
* Absence of relief after 6 weeks of treatment
* History of IV drug use
* Age? Osteoporosis?
* General
  + Approximately 1/3 of patients presenting to ED with LBP get imaging (32% XR, 2.5% CT, <1% MR) (Pakpoor 2019)
  + Asymptomatic patients >60 MR: 36% herniated disc, 21% spinal stenosis, 90% degen/ bulging disc (Boden 1990)
  + Early imaging: worse overall outcomes and likely to identify minor, clinically irrelevant abnormalities (Patel 2016)
  + No difference among patients between XR, MR and CT at 3, 6 and 12 months in the absence of red flags (Chou 2009)
  + The presence of low back pain with radicular features is not an indication for early imaging (Chou 2012)
* Jarvik et al (2003): Compared early MRI to standard radiographs
  + Both modalities resulted in nearly identical outcomes for PCP patients with LBP
  + No benefit to early MRI, increased cost of care due to increased number of spine procedures
* Henschke et al (2009): surveyed 1,172 LBP patients with 25 red flag questions
  + 80% (942/1172) had at least one red flag
  + 0.9% (11/1172) had serious disease

**Case Teaching Points: Pain management in the ED**

ED Management/Analgesia

* Mild: NSAIDS, Acetaminophen, Lidocaine patch
* Moderate: Gabapentinoids, Dopamine antagonists, PO narcotics
* Severe: Propofol, Ketamine, IV/IM/SubQ narcotics
* Evidence based medicine
  + Ibuprofen 400 mg = 600 = 800 for acute pain relief (Motov 2019)
  + Acetaminophen 650 same NNT as Acetaminophen 975/1000 for post op pain (Barden 2004)
  + Ibuprofen 400 mg + Acetaminophen 975 mg = Norco 5 mg = Percocet 5 mg (Chang 2017)
  + Gabapentin: Single dose 600 mg helped with postoperative pain following mastectomy (Grover 2009)

**Differential Diagnosis**

* Non-MSK list, not exhaustive
  + Renal disease (Kidney stone, Pyelonephritis, Nephrolithiasis)
  + Intra-abdominal (AAA, PUD, Dissection, Retrocecal appendicitis, LBO, Pancreatitis)
  + Pelvic disease (PID)
  + Other (Retroperitoneal hemorrhage/mass, Meningitis)
* Musculoskeletal
  + Acute muscle strain
  + Disk herniation (Sciatica)
  + Degenerative joint disease
  + Spondylolithesis
  + Spondylolisthesis
  + Spinal stenosis
* Epidural compression syndromes
  + Spinal cord compression (non-traumatic)
  + Cauda equina syndrome
  + Conus medullaris syndrome
  + Epidural hematoma (spinal)
  + Inflammatory/ Autoimmune
* Ankylosing spondylitis
* Infectious
  + Discitis
  + Vertebral osteomyelitis
  + Epidural abscess (spinal)
* Other
  + Cancer metastasis
* Transverse myelitis
  + Non-organic low back pain- waddell sign

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