

Low Back Pain: Review Questions

Francis H. Shen, MD

QUESTIONS

Choose the single best answer for each question.

- 1. A 63-year-old woman presents with low back pain and cramping in both posterior thighs and numbness radiating into the feet with ambulation. It worsens with standing and walking and improves with sitting and bending forward. She has no bowel or bladder complaints. On examination, she has full strength, normal sensation, reflexes are symmetric, and she has 2+ peripheral pulses. Straight leg raise is negative. What is this patient's most likely diagnosis?**

 - (A) Cauda equina syndrome
 - (B) Herniated disc
 - (C) Internal disc disruption
 - (D) Spinal stenosis
 - (E) Vascular claudication
- 2. A 55-year-old woman presents with a 9-month history of moderate low back pain constant in nature and not relieved with rest. The pain has awoken her from sleep on occasion. She has not had fever, chills, or night sweats; however, she has lost 15 lb over the past 3 months. Her medical history is significant for hypertension and breast cancer treated surgically. What is the next step in this patient's management?**

 - (A) Anti-inflammatory medications
 - (B) Epidural steroid injections
 - (C) Magnetic resonance imaging (MRI) of the spine
 - (D) Physical therapy
 - (E) Plain radiographs of the lumbar spine
- 3. A 65-year-old rheumatoid patient with a long history of intermittent neck pain is brought to the primary care office because her family notes that she has become progressively less functional and is now wheelchair-bound. Physical examination reveals globally decreased strength in her lower extremities, hyperreflexia in both upper and lower extremities with an upgoing Babinski reflex, and a positive Hoffman's sign. Hip range of motion is painful. What is the next step in this patient's management?**

 - (A) Cervical spine radiographs
 - (B) High-dose prednisone taper
 - (C) Hip and pelvis radiographs
 - (D) Lumbar spine radiographs
 - (E) Physical therapy for strengthening and aquatherapy
- 4. A 33-year-old man presents with a sudden onset of back and left leg pain and weakness after performing heavy squats at the gym. Radiographs are normal, but a MRI reveals a posterolateral left L5-S1 herniated disc. What would a careful neurologic examination likely reveal?**

 - (A) Foot plantar flexion weakness with absent Achilles reflex
 - (B) Foot plantar flexion weakness with absent patella reflex
 - (C) Great toe extension weakness with absent Achilles reflex
 - (D) Great toe extension weakness with absent patella reflex
 - (E) Quadriceps extension weakness with absent patella reflex
- 5. A 13-year-old gymnast presents with a 2-week history of low back pain that is activity related and relieved by rest. There is no history of trauma. She denies weight loss, night pain, fever, or chills. Physical examination reveals that she is tender to palpation in the lumbosacral region with restricted range of motion and tight hamstrings. She has full strength and normal sensation throughout. Oblique lumbar spine radiographs demonstrate a**

Dr. Shen is an assistant professor, Department of Orthopaedic Surgery, University of Virginia Health System, Charlottesville, VA.

“Scotty dog” sign suggesting a defect in the pars intra-articularis. What is the best treatment option for this patient at this time?

- (A) Activity modification with therapeutic modalities
- (B) Computed tomography myelogram
- (C) Selective nerve root injection
- (D) Surgical decompression
- (E) Surgical decompression with spinal fusion

ANSWERS AND EXPLANATIONS

1. **(D) Spinal stenosis.** Intervertebral disc degeneration can result in facet hypertrophy, spinal instability, and subsequent spinal canal narrowing (spinal stenosis). Many of these patients are asymptomatic; however, with time and progressive spinal canal narrowing, patients can develop nerve root impingement and symptoms of neurogenic claudication. Forward flexion and sitting increases the cross-sectional area in the lumbar spine and is a natural attempt to decompress the spinal nerves. Conversely, extension results in narrowing of the spinal canal and will aggravate the symptoms. In the patient with vascular claudication, the symptoms typically are not affected by lumbar position and are relieved when then the patient stops walking. In addition, normal peripheral pulses make a vascular etiology less likely. Traumatic herniated discs typically occur in younger patients who have a specific event resulting in the onset of symptoms. This is not the presentation for patients with cauda equine syndrome or internal disc disruption.
2. **(E) Plain radiographs of the lumbar spine.** The typical course of benign back pain should not persist for 9 months and should be relieved with rest. This patient’s history is worrisome for either a spinal tumor or infection. With a past medical history significant for breast cancer and a few positive “red flag” signs (eg, fever, chills, night sweats, unintentional weight loss, anorexia, fatigue, rest or night pain), further evaluation is indicated. While advanced imaging will almost certainly be required, initial management should still begin with plain radiographs. Treatment with anti-inflammatory medications, physical therapy, and epidural steroid injections should be considered only when a thorough work-up is completed and a pathologic etiology has been ruled out.
3. **(A) Cervical spine radiographs.** The cervical spine is frequently involved in the rheumatoid patient, and ligamentous laxity and synovitis can cause progres-

sive cervical subluxation resulting in spinal cord or brainstem involvement. In these patients, a high index of suspicion is required, and if necessary, initial studies should include plain cervical spine radiographs. This patient’s physical examination findings are consistent with upper motor neuron findings and myelopathy. Lumbar spine, hip, and pelvis radiographs may demonstrate rheumatologic involvement in these areas; however, the etiology of her myelopathy and progressive loss of function should be evaluated first. There is no role for a high-dose prednisone taper in this patient.

4. **(A) Foot plantar flexion weakness with absent Achilles reflex.** A careful neurologic examination in patients with a herniated disc often yields objective evidence of nerve root compression. A patient with a far-lateral L5-S1 disc herniation would have involvement of the exiting L5 nerve root, while a L5-S1 posterolateral herniated disc would involve the traversing S1 nerve root. S1 nerve root involvement would result in foot plantar flexion weakness and an absent Achilles reflex. Quadriceps weakness with an absent patella reflex is associated with L4 nerve root compression, and great toe extension would be more consistent with the motor supply from L5 nerve root. There is no consistent reflex associated with the L5 nerve root.
5. **(A) Activity modification with therapeutic modalities.** Spondylolysis, or a bony deficiency in the pars intra-articularis, is a common cause of low back pain among children and adolescents. Symptoms typically include low back pain with occasional hamstring tightness. The classic radiographic finding is the presence of the “Scotty dog” sign, which is visualized best on the oblique lumbar radiograph. In this view, the outline of the posterior elements of the spine resemble a Scottish terrier, with the defect of the pars intra-articularis seen as a lucency crossing the neck of the Scotty dog. Most authors believe that spondylolysis is an overuse syndrome, particularly in patients that participate in hyperextension activities, especially gymnastics, interior football linemen, and swimmers who perform the butterfly stroke. Initial management is conservative treatment with activity modification and therapeutic modalities as needed. Surgical intervention, injections, and computed tomography myelogram are not indicated in the patient that presents for the first time with isolated back pain symptoms.