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Introduction

Low back pain is one of the most commonly encountered complaints in the medical practice. The results from The National Health Care Survey published by the U.S. Department of Health and Human Services show that spinal problems are among the top primary diagnoses during the ambulatory care visits [1]. The prevalence has been increasing over time, [1] which correlates with an increase in opioid prescribing, [2] and escalating utilization of interventional pain management techniques and surgical procedures [3]. Low back pain is also a common cause of lost productivity and workdays.

Epidemiology and Risk Factors

Approximately 54–80% of the adult population will experience LBP at least once in their lifetime [3]. The majority of patients will experience relief of their symptoms, however a subset of the population may advance to a diagnosis of chronic low back pain. The prevalence of chronic LBP is 2–40%, [3] and varies between etiologies and age groups. For example, degenerative disc disease, facet joint and SIJ-related pain, and pain due to spinal stenosis predominate in the older adults [4, 5].

Diagnosis

Clinicians should first aim at ruling out nondegenerative pathology when approaching patients with chronic back pain. History and physical examination are used to make the correct diagnosis and formulate an appropriate therapeutic plan. Routine MRI imaging for an acute onset of low back pain is not warranted as it does not improve outcomes, and has a little value in delivering appropriate therapy while exposing patients to radiation and may result in unnecessary treatments for incidental findings. Therefore, immediate MRI should be reserved for patients with nonspecific back pain demonstrating any of the “red flag” signs/symptoms (fever, unintentional weight loss, history of malignancy, urinary retention/incontinence, perineal anesthesia, history of

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trauma and osteoporosis). Such patients require an urgent diagnostic work-up followed by an appropriate medical or surgical intervention.

Treatment Options

Conservative Management

The best therapeutic outcomes are achieved with multidisciplinary pain treatment programs. The initial therapy consists of conservative measures involving physical therapy, and topical and/or oral pharmacological agents. Exercise programs and spinal manipulations may reduce pain and help limit medication use. Behavioral therapy can help to augment pain perception, eliminate catastrophizing behaviors, and aid coping skills, which are recommended for optimal treatment outcomes. Various pharmacologic agents are available, including nonsteroidal anti-inflammatory drugs (NSAIDs), opioids, and adjuvant agents (antidepressants, anticonvulsants, and muscle relaxants). NSAIDs are an effective first-line option for the treatment of both acute and chronic low back pain; however, use of NSAIDs should be limited to a short period of time. Opioids are associated with many adverse reactions, as well as risk of dependence, addiction, abuse and overdose, therefore this option requires a careful patient selection, risk assessment, close monitoring and regular follow-up. Skeletal muscle relaxants should only be used for short period of time for spastic back pain. Antiepileptics are a valuable remedy for radicular-type of pain and symptoms of paresthesia. Antidepressants (TCAs and SNRIs) have also a role in treating LBP with neuropathic component, especially in patients with psychiatric comorbidities.

Interventional Pain Management

(A) Epidural steroid injections are indicated for radicular pain or radiculopathy secondary to disc herniation, spinal canal stenosis, and post-laminectomy syndrome. The epidural space, which resides between the ligamentum flavum posteriorly and dura mater ante-

riorly and extends from the foramen magnum down to the sacrococcygeal ligament can be accessed using interlaminar, transforaminal, and caudal approaches. The interlaminar approach entails advancing the needle ventrally through supraspinous ligament, interspinal ligament, and ligamentum flavum. The transforaminal approach involves placing analgesic medication directly around a specific nerve root corresponding with the symptoms manifested by the patient. Caudal and transforaminal techniques are particularly useful for patients with post-laminectomy syndrome due to the presence of scar tissue limiting access via the interlaminar approach.

The rationale behind the use of ESIs is that the steroid injectate reduces the inflammation around nerve roots mediated by the chemicals leaked from the diseased nucleus pulposus (phospholipase A2, substance P, calcitonin gene-related peptide, vasoactive intestinal peptide, and lactate, bradykinin, histamine), reduce swelling and provide antinociception.

(B) Facet joint interventions are utilized to block the pain originating from the nociceptors present at the zygapophyseal joints in conditions such as facet arthropathy or facet joint syndrome. This condition is characterized by a well-localized axial pain, which may be referred to specific areas with dermal representation and mapping, for example buttocks, groin, and posterior thigh, but rarely below the level of the knee. Facet joints derive sensory innervation from the medial branches of the dorsal primary ramus at the same vertebral level and from the level above.

Facet joint injections include intra-articular injections, medial branch blocks, and radiofrequency ablation of the medial branches, Fig. 138.1. Radiofrequency ablation (RFA) is performed to provide more sustained pain relief after a positive response (>75%) is obtained with diagnostic medial branch block.

(C) Sacroiliac joint pain can be addressed with intra-articular steroid injection, periarticular

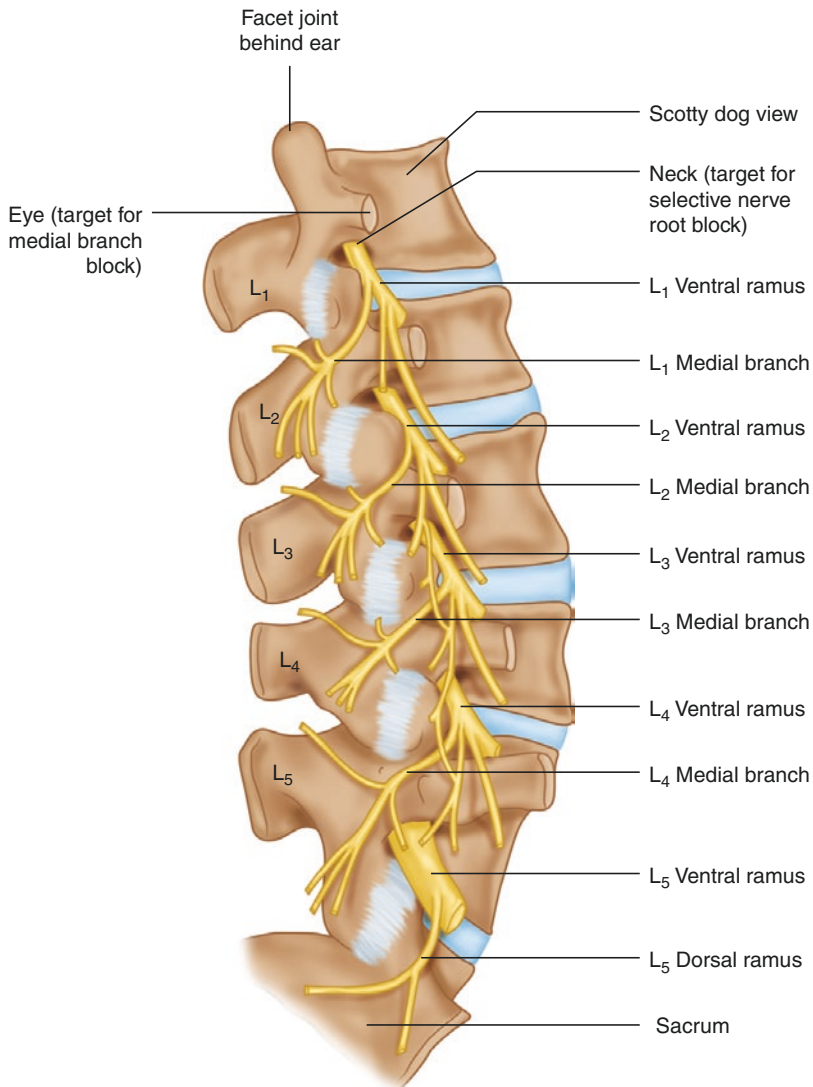


Fig. 138.1 Medial branch blocks in the lumbar region (targets represented by circles)

injections, as well as with pulse or cooled radiofrequency neurotomy. SIJ pain involves lower back and/or upper buttock areas, and may be referred to the groin, greater trochanter or upper posterolateral thigh areas.

Neuromodulation

Spinal cord stimulation (SCS) is a valuable and cost-effective tool for the management of persistent low back or leg-dominant post-laminectomy

syndrome. Conventional spinal cord stimulators involve placement of a paddle or electrode leads into the dorsal epidural space to reduce or eliminate the experience of pain by stimulating the A-beta nerve fibers.

Dorsal root ganglion stimulation is a newer advanced technique, which provides enhanced paresthesia-free stimulation compared to the traditional SCSs. Dorsal root ganglia are bundles of cell bodies containing afferent sensory neurons located within the intervertebral foramina in the lateral recess of the epidural space.

High Yield Points

- Low back pain is a highly prevalent condition leading to disability, lost productivity and high financial expenditure.
- Therapeutic approaches include topical and oral medications, physical therapy, spinal manipulations, behavioral therapy, interventional pain management techniques and neuromodulation.
- Opioid medications have limited long-term effectiveness and high risk of adverse effects.
- Gabapentinoids and antidepressants are helpful for pain with neuropathic component.
- Interventional pain management techniques and neurostimulation are indicated for patients with pain poorly responsive to conservative treatment measures.
- Epidural steroid injections are used for radicular pain and radiculopathy symptoms.
- Facet joint interventions are indicated for facet joint pain and involve blockade of medial branches of dorsal rami.
- Spinal cord stimulators prevent transmission of pain signals by stimulating dorsal root ganglia or dorsal column with or without producing non-painful paresthesia sensations.

Questions

1. A 65 y/o male comes to the clinic complaining of a long-standing bilateral low back pain for several months. He denies any traumatic event or injury preceding the pain. The pain is aching in character and spreads to the buttocks and occasionally to the posterior thigh. He explains that he is having a difficulty walking straight and prefers sitting, bending forward. The patient denies leg weakness, numbness and tingling in the legs, and loss of control over his bladder and/or bowels. He did

not have any imaging done. Physical exam is notable for paraspinal pain to palpation, limited extension and rotation of the spine, and negative straight raise leg test. What is the best next step in the management of this patient?

- A. Gabapentin 100 mg PO TID x 3 days followed by 300 mg TID afterwards
- B. Bilateral lumbar medial branch blocks performed using local anesthetic without steroids
- C. Hold any interventions until MRI study becomes available
- D. Intralaminar epidural steroid injections

Answer: B

2. Which of the following would preclude performing of epidural steroid injection in patients taking a blood thinner medication?
 - A. Once daily baby aspirin in a patient with low cardiovascular risk
 - B. Warfarin held 5 days prior to the injection with INR of 1.4
 - C. Clopidogrel held 3 days before the planned procedure
 - D. Subcutaneous low molecular weight heparin given 13 h before the injection

Answer: C

3. A 55 y/o female with PMHx of HTN, DM with peripheral neuropathy, HLD, LBP and long-term opioid use reports persistent debilitating lower back pain and bilateral leg pain. She has undergone lumbar laminectomy and fusion surgery 3 years ago, but the pain returned 1 year later. The patient reports using various medications including opioids, ibuprofen, and gabapentin, which provide only a transient pain relief. She had undergone several transforaminal epidural steroid injections and has been participating in physical therapy but did not experience any pain relief. What is the most appropriate next step in the management?

- A. Caudal epidural steroid injection
- B. Neurosurgical consult for spinal revision surgery
- C. Escalating the dose of opioid medications
- D. Psychological evaluation for trial of spinal cord stimulator

Answer: D

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