

Chronic Low Back Pain

An Interventional Approach



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According to the distribution of pain, chronic low back pain (CLBP) can be categorized into either axial or radicular type (Table 1). Patients with axial pain usually complain of midline or paramedian pain whereas patients with radicular pain complain of radiating pain from midline spine to foot and may have motor sensory deficit and abnormal reflex.

The most common pain generators of LBP are disc, facet and nerve root. It is important to rule out "red flag" for LBP due to infection or tumour that may need to be surgically addressed.

Asymptomatic patients may have abnormal MRI/CT findings.^{1,2} Conversely, symptomatic patients may have normal MRI or CT findings. Therefore, it needs to be clinically correlated with diagnostic blocks.

Lumbar radicular pain and lumbar epidural steroid injection

Radicular pain refers to radiating pain usually in dermatomal distribution. Radiculopathy, however, refers to sensory, motor deficit and reflex abnormality. It is not unusual to have a patient complaining of radicular pain without radiculopathy or vice versa. Common causes of lumbar radicular pain are disc herniation, spinal stenosis, chemical irritation and failed back surgery syndrome (Table 2). The diagnosis of lumbar radicular pain/radiculopathy is usually made clinically on history and physical exam,

Table 1

Chronic low back pain

Axial pain

- Discogenic
- Facet joint
- Sacroiliac joint
- Myofascial

Radicular pain

- Lumbar nerve root radicular pain

occasionally requiring diagnostic selective nerve root block (Table 3). Electromyography, MRI or CT findings are only confirmatory.

Lumbar epidural steroid injection is offered to patients who suffer from persistent lumbar radicular pain with or without radiculopathy refractory to conservative treatments. Currently there are three different approaches: interlaminar, caudal and transforaminal epidural approach which is done under fluoroscopic guidance. The success rate varies from 18% to 90%.¹ Carette *et al*² in a prospective, randomized, double-blind study on 158 patients with sciatica due to disc herniation proven by CT showed that the lumbar epidural steroid injection with 80 mg of methylprednisolone mixed with isotonic saline, provided short-term improvement (six weeks) in leg pain and sensory deficit, but no significant functional benefit.²

In the transforaminal epidural steroid injection (TFESI), the needle is inserted near the suspected nerve root (based on history and



Table 2

Causes of lumbar radicular pain

- Herniation of disc (nucleus pulposus)
- Most common
 - > 90% involve the L5-S1 (fifth lumbar-first sacral vertebral disc) or L4-L5 vertebral disc
- Decrease in the size of the lateral bony canal
- Hypertrophy of the lumbar facet
- Chemical irritation
- Failed back surgery syndrome



Figure 1. Transforaminal lumbar epidural steroid injection of L5 nerve root under fluoroscopy.

physical exam) under the fluoroscopic guidance (Figure 1). There are rare but devastating complications such as spinal cord infarct with lumbar TFESI. The most recent systemic review on TFESI³ showed strong evidence for transforaminal lumbar epidural steroid injection for short-term (less than 6 weeks) and moderate evidence for long-term (more than 6 weeks).

Lumbar facet joint pain and facet denervation

Lumbar facet joint pain accounts for 15% to 45% of CLBP⁴ and is suspected clinically based on history and physical examination. It is common in young patients who sustained sudden twisting or flexion-extension type injury of low back and complain of axial but commonly radiate down to posterior thigh. It is described as deep aching pain in the paravertebral regions of the low back which is worse in the morning after prolonged supine position, standing or reduced with walking.

Physical examination shows exacerbation of the same type of pain on hyperextension of the ipsilateral lumbar spine and on palpation of the paravertebral regions of the low back. Diagnostic imaging may show normal facet joint. Conversely, facet arthropathy shown on diagnostic imaging (plain x-ray, CT, or MRI) does not mean that the facet joint is the pain generator. For example, it is very common to

have degenerative facet joint disease especially in the elderly who are asymptomatic. Diagnostic lumbar medial branch block is required to make a definitive diagnosis of lumbar facet joint as a pain generator by inserting a needle near the medial branch of posterior rami (of usually L3, L4, L5) under the fluoroscopic guidance. Once two diagnostic lumbar medial branch blocks are positive, the patient is considered to be a candidate for lumbar facet denervation with the radio frequency (RF) lesioning. The success rate for lumbar facet denervation with RF lesioning varies from 17% to 90%⁷ and lasts six to nine months as the nerve grows back. However, this can be repeated.

Discogenic pain and provocative discogram

Twenty six per cent to thirty nine per cent of CLBP is contributed by lumbar discogenic pain.^{8,9} The distribution of discogenic pain is similar to facet pain. However, it is exacerbated by sitting and bending forward, reduced by lying down and may or may not be associated with radiculopathy and/or radicular pain. It usually responds to conservative treatment. There is no definite interventional treatment except surgery in severe cases. Many asymptomatic patients have abnormal disc pathology on either CT or MRI.

Table 3

Diagnosis of lumbar radicular pain or radiculopathy

- Radicular pain below the knee in dermatomal distribution
- Positive nerve root tension sign:
 - Straight Leg Raise (SLR), crossed SLR test
- Nerve root specific reflex, sensory and motor dysfunction
- With/without positive diagnostic selective nerve root block
- Diagnostic imaging and electromyography: confirmatory

The severity of a disc herniation does not correlate with the severity of disc pain.⁸ Not all degenerative discs are painful. Provocative discogram is a procedure designed to identify a painful intervertebral disc. It is a “radiological palpation for tenderness.” It is beyond the scope of this article except to mention that it is a painful fluoroscopic procedure requested prior to surgery and is done to resolve medicolegal issues to prove/disprove the cause of pain.

Summary

From interventional pain point of view, if the patient has lumbar radicular pain with or without radiculopathy refractory to conservative treatment, one needs to consider lumbar epidural steroid injection. However, one needs to be aware of short-term pain relief. If the patient presents with axial pain then determine whether it is facet, disc, or sacroiliac (SI) joint origin. If facet joint pain is suspected clinically then consider a diagnostic fluoroscopic guided medial branch block for consideration of facet denervation with RF. If pain is disc origin confirmed by MRI and the patient exhibits motor

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Table 4

Summary of interventional pain management of chronic low back pain

Radicular (lumbar) pain

Consider lumbar epidural steroid injection (ESI)
Transforaminal ESI has a higher success rate but be aware of complications

Axial pain

Consider diagnostic medial branch block for facet joint pain
Provocative discogram for discogenic pain
Diagnostic sacroiliac joint block for SI joint pain

Consider facet denervation with radio frequency lesioning or surgery

sensory deficits affecting lifestyle refractory to conservative management then referral to surgery is recommended. Some surgeons recommend provocative discogram prior to surgery. Sometimes provocative discogram is useful for medicolegal purpose. The diagnosis and the treatment of SI joint pain is somewhat controversial and is beyond the author’s clinical experience.

My impression is that if the correct diagnosis is made and precise placement of needle to the site specific pain generator is made, then the chances of success rate will be higher.

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For references, please contact cme@sta.ca