

Managing Leg Dominant Pain

■ Abstract ■

Leg dominant pain suggests direct nerve root involvement: radicular, not referred symptoms. Constant pain associated with positive neurological findings usually results from an acute disc herniation. Symptoms are the result of mechanical compression but principally reflect an inflammatory response, properly designated sciatica. Intermittent leg dominant pain triggered by activity in extension and relieved by rest in flexion probably represents neurogenic claudication: nerve root ischemia secondary to spinal stenosis. Except for acute cauda equina syndrome, acute sciatica is initially managed with scheduled rest, adequate medication, and time. Non-responsive cases may require surgery. Surgery also shows superior outcomes for disabling neurogenic claudication.

Key words: leg dominant pain, sciatica, neurogenic claudication, cauda equina syndrome, surgery

Leg dominant pain occurs much less frequently than does axial back pain.^{1,2} Most patients with back pain have episodic radiation into the legs but predominant proximal pain. True leg dominant pain puts the area of maximum intensity around and below the inferior gluteal

fold, in the thigh, calf, ankle, or foot. Back, buttock, or groin pain may be present, but the lower limb symptoms are clearly the major complaint. This distribution strongly suggests pathology directly involving the lumbar nerve roots producing radicular, not referred, pain.

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Obviously, not all leg pain comes from the back. The pain of an osteoarthritic hip can spread to the knee and be mistaken for nerve root irritation. Intermittent claudication from peripheral vascular disease can be confused with leg pain caused by spinal stenosis.³ True spine-generated leg dominant pain is consistently reproduced, exacerbated, or relieved by particular spinal movements or positions. It is not associated with local findings such as absent pulses or typical thigh pain on flexion and internal rotation of the hip. Radicular symptoms can occasionally coexist with non-spinal pain, but an accurate history and a precise physical examination almost always distinguish between them.

The location and the presentation of leg dominant pain can vary. The pain may be felt in the thigh or settle in the lower leg and foot. It may begin in the lower buttock near the gluteal fold. Leg dominant pain may be accompanied by tingling or numbness in a dermatomal pattern. When associated with minimal axial back pain, this is also considered leg dominant. The pain can shift, and more than one site can be affected at once. It may be constant or intermittent. Constant leg dominant pain usually results from the herniation of an intervertebral disc, producing inflammation and nerve root compression. It is the inflammation, not the mechanical pressure, that accounts for most of the early symptoms and the constant pain. Onset is often rapid and may be preceded by an episode of back dominant pain, presumably as the disc fails prior to

the frank rupture. This constant leg pain is correctly designated *radiculopathy* or *sciatica*.⁴

Age-related osteoarthritis of the posterior spinal structures leads to a narrowing of the lumbar spinal canal, labelled *spinal stenosis*.³ Intermittent leg dominant pain with or without associated numbness and weakness is produced by bony compression interfering with blood flow to the nerve roots.⁵ Because the canal dimensions vary with posture, the symptoms increase as space for the nerve decreases in extension, typically upon standing or walking, and subside as the available room increases in flexion, with bending forward or sitting. Ordinarily insidious in onset, this pattern is slowly progressive. Leg dominant pain aggravated by activity in extension and eliminated by rest in flexion is termed *neurogenic claudication*.³

Both constant and intermittent leg dominant pain can be associated with neurological symptoms. A diagnosis of sciatica must have supporting physical findings, either a positive irritative test or, less frequently, decreased power, sensation, or reflex response. Very rarely, the disc protrusion produces only a brief period of leg pain but leaves a continuing neurological deficit.

For patients with intermittent leg pain of spinal origin, the neurological assessment is typically normal, particularly when the patient is examined at rest. Transient weakness can occur during activity. Because they lack the inflammatory component of sciatica, patients with neurogenic claudication do not dem-



Key Point

Involving the patient reduces the sense of helplessness that can accompany disabling pain.

onstrate irritative findings but as the condition progresses may develop a permanent local loss of motor or sensory function.

IN CONTRAST TO THE BACK DOMINANT CASES, THERE IS A DEFINITE ROLE FOR SHORT-ACTING NARCOTICS OR PSYCHOTROPIC DRUGS FOR UNCONTROLLED PAIN.

Treatment begins with education and reassurance. The clinician must be confident of the diagnosis in order to appreciate and share the generally favourable natural history.³⁻⁶ In the absence of a progressive neurological deficit or cauda equina syndrome, leg dominant pain warrants a trial of non-operative treatment.⁷ It can also be effectively treated with injections or surgical intervention when simpler methods fail.^{8,9}

Treatment of Sciatica

Due to the chemical irritation, sciatica rapidly escalates and can be excruciating. The initial treatment goal is to reduce the inflammation while managing the pain through a program of scheduled rest. This is not merely putting the patient to bed. It starts in the office or clinic by identifying the position or positions that most effectively diminish the leg pain. Given the nature of the pathology, stopping the leg pain completely is impossible.

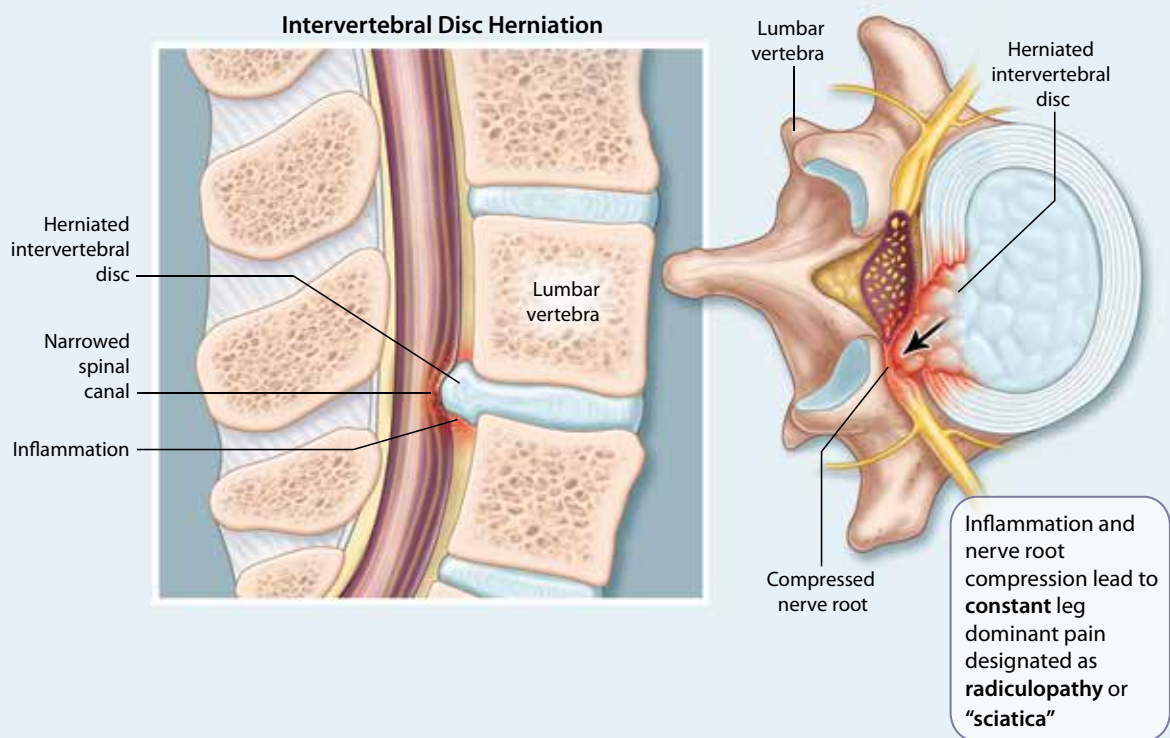
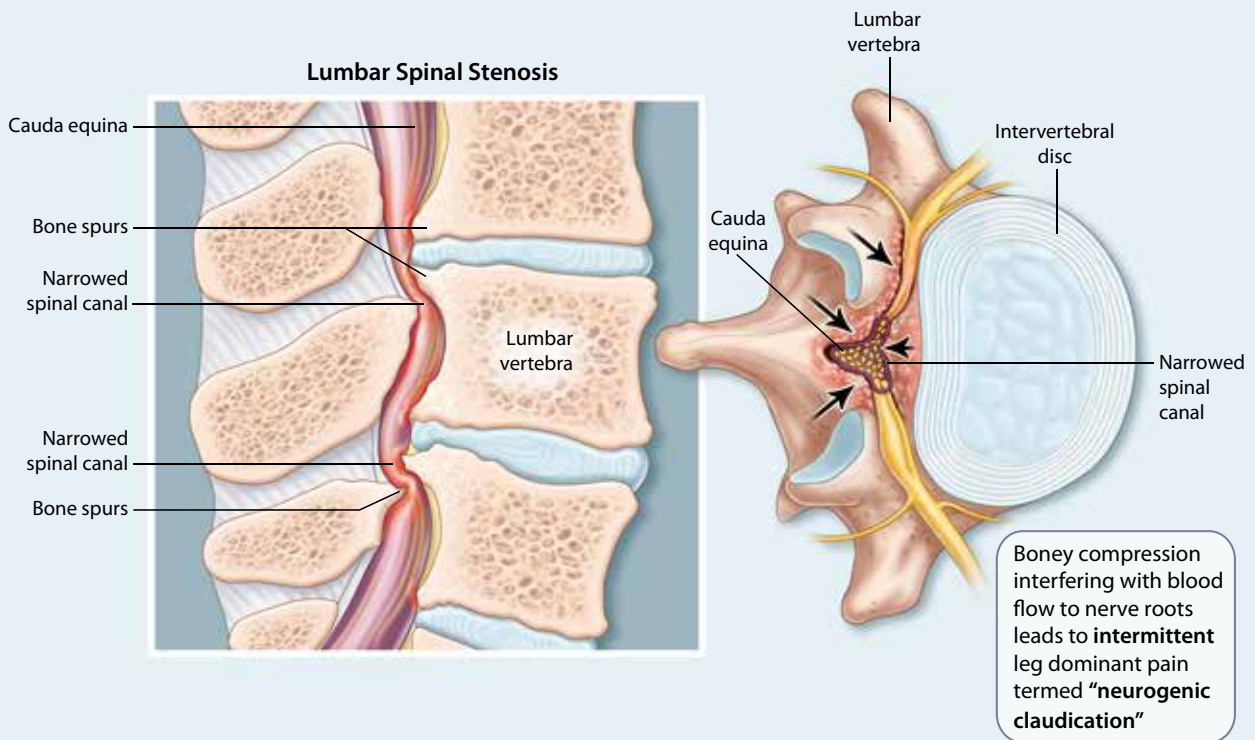
The most effective position is commonly the “Z” lie. The patient

lies supine with the lower legs supported on the seat of a chair. The amount of flexion is critical and as a rule, the more, the better; therefore, the hips are generally flexed beyond 90 degrees. The patient remains in the optimal posture for as long as the leg pain remains reduced. The results of this manoeuvre form the basis of a directed, self-treatment routine. An identical rest position is created at home. Based on the observed response time, the patient spends the same period of every daytime hour at rest, while the remainder of each hour is used for necessary functions. The target is to decrease the leg pain to the same level achieved in the office.

Involving the patient reduces the sense of helplessness that can accompany disabling pain. Scheduled rest offers a measure of pain relief and a sense of progress, but this must be reinforced by confident reassurance from the clinician that the acute phase customarily resolves within 4–6 weeks.⁴ Trying various rest positions, such as lying prone over several pillows, to find one that works poses no risk. There is no indication for movement-based routines, stretches, or exercise, but any passive modality that provides relief can be useful.

Because of the intensity of the pain, analgesic medication is normally required. Non-prescription pain relievers may not be sufficient, and the anti-inflammatory effect of nonsteroidal anti-inflammatory drugs (NSAIDs) may be inadequate to deal with the inflammation. A brief course of high-dose oral ster-

Figure 1:
Pathological Basis of Leg Dominant Pain



oids addresses the problem, but there is no convincing evidence of its positive effect.¹⁰ In contrast to the back dominant cases, there is a defi-

OVER 80% OF ATTACKS OF ACUTE SCIATICA RESOLVE WITH TIME AND APPROPRIATE CARE; SURGERY IS INFREQUENTLY INDICATED.

nite role for short-acting narcotics or psychotropic drugs for uncontrolled pain.^{6,8,11,12}

Obtaining a computed tomography scan or magnetic resonance imaging is a precursor to invasive treatment. No investigation is required for a patient presenting an unequivocal clinical picture and exhibiting steady predictable improvement.^{6,13} Visualizing the herniation does not speed recovery and should not change the management.

Over 80% of attacks of acute sciatica resolve with time and appropriate care; surgery is infrequently indicated.⁹ The initial acute episode is normally followed by a progressive decline in the intensity of the leg pain and the resolution of any residual neurological deficits. Full recovery can take a year or more. For those whose disabling leg symptoms persist, selective nerve root or epidural steroid injections may lessen the pain and hasten the return to function but have not been shown to alter the long-term outcome.¹⁴

Surgery for sciatica carries a success rate above 90%. Studies

suggest that the final disposition of patients treated non-operatively is about the same as for those managed with surgery, although the recovery rate may be faster with an operation.⁹ The decision for surgery should be based not only on the clinical findings and how well they match with an appropriate image but also on patient preference. An inability to cope with the pain and a willingness to accept surgery are both important considerations.

Treatment of Cauda Equina Syndrome

Cauda equina syndrome is a rare and serious neurological disorder that demands urgent intervention.⁷ It is caused by compression of the nerve roots within the central lumbar spinal canal, most often by a massive posterior disc herniation. The striking features are bilateral sciatica on single straight leg raise, saddle anaesthesia, and sudden urinary retention followed by insensible overflow and fecal incontinence. The treatment of acute cauda equina syndrome is surgical decompression. Patients operated within 48 hours of onset are more likely to have better outcomes.

Treatment of Neurogenic Claudication

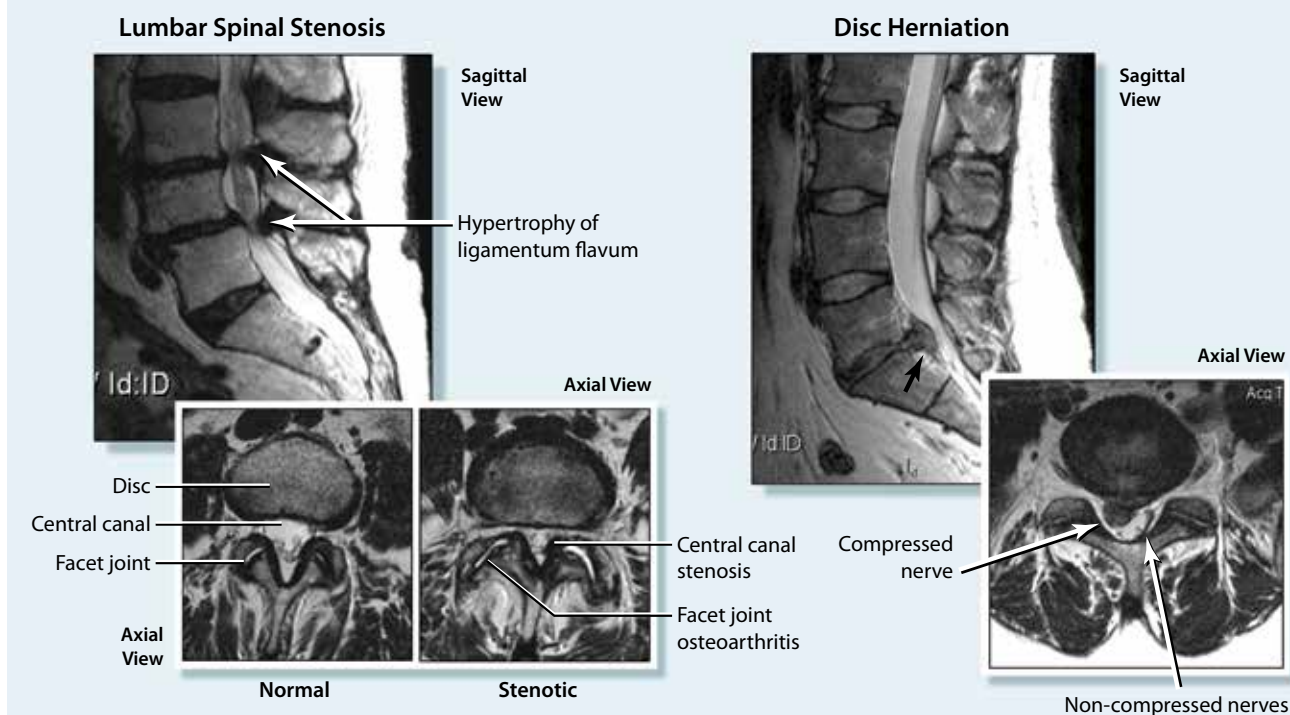
Managing neurogenic claudication is more about maintaining or restoring function than about controlling the intermittent leg pain.⁵ Sitting in a flexed posture for a few minutes usually controls the symptoms. Distinguishing neurogenic claudication from peripheral vascular claudication can be challenging.³ The clinical difference lies mainly in the symp-



Key Point

Managing neurogenic claudication is more about maintaining or restoring function than about controlling the intermittent leg pain.

MRI Scans Demonstrating the Pathological Basis of Leg Dominant Pain



*MRI scans courtesy of Dr. Rampersaud

tom response to position change, and the diagnosis is confirmed with normal vascular studies and images of a narrow spinal canal. Neurogenic claudication affects about 20% of people over 65 years of age, and about half of that group suffer serious restrictions in their daily routines.^{5,15}

Because the volume of the lumbar canal is greatest in flexion, exercise therapy focuses on abdominal strengthening to allow patients to sustain a flexed posture by tilting the pelvis as they stand or walk. While this is a reasonable concept, in an older age group often unaccustomed to physical activity, commitment is difficult and compliance is poor.¹⁶

Medication has a limited role. Analgesics are seldom required as pain control is easily achieved. Since the problem is a lack of space in the canal, epidural steroid injections have not proven particularly effective.¹⁶ Advice on lifestyle modification may be constructive but cannot eliminate the patient's existing limitations.

Treatment success is measured by improvement in symptoms and function and an increase in walking distance or standing tolerance. For patients who have maintained an acceptable routine in spite of their reduced capacity, no treatment is necessary. For those who can no longer accomplish the tasks of daily



Key Point

Of the four back pain syndromes, only neurogenic claudication is consistently best treated by surgery.



Key Points

True spine-generated, leg dominant pain is consistently reproduced by particular spinal movements or positions.

No imaging investigation is required for a patient presenting an unequivocal clinical picture and exhibiting steady predictable improvement.

Of the four back pain syndromes, only neurogenic claudication is consistently best treated by surgery.

In contrast to the back dominant cases, in sciatica there is a definite role for short-acting narcotics or psychotropic drugs for uncontrolled pain.

living, non-operative care achieves limited benefits.¹⁶

Of the four back pain syndromes, only neurogenic claudication is consistently best treated by surgery.^{17,18} For the ideal surgical candidate—a healthy patient who is significantly disabled with one-, two-, or three-level stenosis—surgery produces a sustained improvement in quality of life, equivalent to a lower limb total joint replacement.¹⁹

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Clinical Pearls

Criteria for Surgical Referral

Emergency Referral

The symptoms of Cauda Equina Syndrome are:

- Urinary retention followed by insensible urinary overflow.
- Unrecognized fecal incontinence.
- Loss or decrease in saddle/perineal sensation.

Acute Cauda Equina Syndrome is a surgical emergency.

Consider Elective Referral

Failure to respond to a trial of conservative care:

- Unbearable constant leg dominant pain
- Worsening nerve irritation tests (SLR or femoral nerve stretch)
- Expanding motor, sensory or reflex deficits
- Recurrent disabling sciatica
- Disabling neurogenic claudication

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