

An Overview of Back Pain and Sciatica

Mohammad Maleki, MD, FRCSc

Presented at McGill University's Thursday Evening Learning Series, Montreal, Quebec.

Back pain affects millions of people and is among the most common conditions for which patients seek medical attention. It is a huge health problem with associated enormous socio-economic impact on society. It is not a new problem; people have been suffering from back ailments for thousands of years, however, it was not till 1934, when Mixter and Bar described derangement of intervertebral disc as a major culperate for development of low back pain (LBP). Although chronic degenerative lesions of lumbar disks and intervertebral facet joints and ligaments may be responsible for LBP in a significant number of patients, in many others the exact cause of the pain disorder cannot be identified. Point prevalence of LBP is about 20%.

Spinal pain disorders could be classified into six broad categories:

- Myofascial syndrome
- Inflammatory syndrome
- Neural compression syndrome
- Mechanical (instability) syndrome
- Neuropathic syndrome
- Psychosocial-economic syndrome

The nucleus pulposus (load bearer) alters its shape under pressure, transmitting the forces radially to the annulus fibrosus and the cartilaginous end plates.

This biomechanical function of disc depends

Denis' case

Denis, 46, had his second episode of sciatic pain involving his calf, exacerbated with valsalva. His radicular symptoms persisted after 2 months of medical therapy. Recently, he had some trouble voiding. He has decreased sensation of his left big toe, with restricted Lasegue test and moderate weakness of ankle dorsiflexion. Perineal sensations, as well as tendon reflexes were preserved. MRI showed fairly large extruded disc at L4-L5 level. He underwent a micro-discoidectomy, with satisfactory outcome.

on its water content (at birth 88%, at 70-years-old 66%).

Disc degeneration and herniation is a multifactorial process (aging, trauma, vocational constitutional, nutritional, genetic, familial, *etc.*).

These factors may lead to some degree of discal protrusion, which may or may not become symptomatic. Upon imaging, by age 40, about 40% of the population may have radiological evidence of herniated lumbar disks and only 1% to 2% has neurological symptoms (Figure 1).

Nerve root dysfunctions are due to:

- mechanical deformation,
- inflammatory process, or
- vascular changes.

Myotomal or referred pain patterns should be differentiated from true sciatica. In the later case,

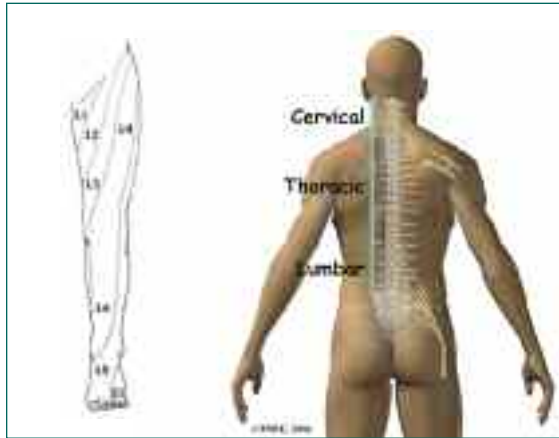


Figure 1. Lumbar nerve roots and their dermatomal patterns.

there are usually associated neurological symptoms. Most common symptomatic lumbar disc herniations are at L5-S1 and L4-L5 levels, less common at L3-L4 and unusual at higher levels.

Symptomatic herniations usually manifest clinically during most active life period (30- to 50-years-of-age). Natural history of first episode of sciatica is that > 50% are better within three months and 70% to 80% improves within six months. Adding some sort of non-surgical treatment (such as short period of reduced mobility, pharmacotherapy and physiotherapy) may enhance the recovery. Twenty to thirty per cent of patients may not improve, or develop recurrent symptoms requiring further medical and/or surgical treatments.

Spinal stenosis

Spinal stenosis is due to degenerative disc disease, facet and ligamentous hypertrophy, which could be accentuated due to congenital short pedicles, hence leading to symptomatology at an earlier age (40- to 60-years-old, instead of > 60-years-old for the acquired stenosis). Standing and walking transiently increases

lordosis, accentuating stenosis by exaggerating the enfolding of the ligamentum flavum into the central canal, or lateral recess, thus exacerbating the symptoms.

Sitting and recumbency, or slight forward bend while walking, decreases lordosis, hence symptoms improve.

Back pain affects millions of people and is among the most common conditions for which patients seek medical attention.

When to operate?

Optimal timing of disc surgery has not been established.


Sociocultural preferences account for a wide variation in the rate of surgery in different countries. The dilemma in selecting treatment for patients with lumbar disc herniation is not to operate too hastily on patients who may improve without surgery but not withhold surgery for prolonged period, if patients do not respond to nonoperative measures.

Recommendations of the American Association of Neurological Surgeons and the American Academy of Orthopedic Surgeons include:

- Failure of conservative treatments (four to six weeks)
- Demonstration of root compression upon imaging, which corresponds to patient's radicular symptoms

- Objective neurological deficits (sensory, motor, reflexes). Sphincter involvement urges for much earlier surgery

A randomized clinical trial¹ comparing surgery vs. non-surgical treatment found that patients assigned to surgery, only 50% were operated and those assigned to nonoperative treatment, 30% crossed to the operated group. It was concluded that the superiority or equivalence of the treatments were not warranted based on the intent-to-treat analysis. According to another randomized clinical trial,² patients are more likely to choose surgery if they are not able to cope with leg pain.

The ideal patient for discectomy is one in severe, disabling, unilateral, radiculopathic leg pain without severe sensory-motor loss, for whom conservative measures over a period of a few weeks to two months have yielded very little. A poorer recovery can be expected in the presence of severe sensory motor loss once pain has remitted or has acquired the burning deafferentation quality, suggestive of nerve root damage.³ 



Dr. Maleki is an Assistant Professor, Department of Neurosurgery, McGill University Health Center, Montreal, Quebec.

Take-home message

- The majority of patients with sciatic pain improve spontaneously
- Those with intolerable pain and persisting associated neurological symptoms may benefit from surgical intervention (75%-85% improvement)
- Fifteen to twenty-five per cent may not improve, or have recurrent symptoms, due to a variety of reasons and fall under the category of chronic failed back surgery syndrome, with enormous socioeconomic burden on the society

References

1. Weinstein JN, Tosteson TD, Lurie JD, et al: Surgical Vs Nonoperative Treatment For Lumbar Disk Herniation: The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial. *JAMA* 2006; 296(20):2441-50.
2. Peul WC, van Houwelingen HC, van den Hout WB, et al: Surgery Versus Prolonged Conservative Treatment For Sciatica. *NEJM* 2007; 356(22):2245-56.
3. Benzel, et al: Lumbar Disc Surgery. In the text of Spine surgery (Elsevier, Churchill, Livingstone, Second Edition, 2005), pp.601-618.
4. Arts MP, Peul WC, Koes BW, et al: Management Of Sciatica Due To Lumbar Disc Herniation In The Netherlands: A Survey Among Spine Surgeons. *J Neurosurg Spine* 2008; 9(1):32-9.

Resources

1. Hardy R: Treatment of Disc Disease of Lumbar Spine. In Youmans, *Neurological Surgery text*, Saunders, Fifth Edition, 2003, pp.4507-4539.
2. Gibson JN, Waddell G: Surgical Interventions For Lumbar Disc Prolapse: Updated Cochrane Review. *Spine* 2007; 32(16):1735-47.
3. Gleave JR, Macfarlane R: Cauda Equina Syndrome: What Is The Relationship Between Timing Of Surgery And Outcome? *Br J Neurosurg* 2002; 16(4):325-8.
4. Arts MP, Peul WC, Koes BW, et al: Management Of Sciatica Due To Lumbar Disc Herniation In The Netherlands: A Survey Among Spine Surgeons. *J Neurosurg Spine* 2008; 9(1):32-9.

HELPS PREVENT BONE LOSS AND OSTEOPOROSIS
With 400 IU Vitamin D

Caltrate PLUS

PAAB

Product Monograph available upon request
Wyeth Consumer Healthcare Inc. Mississauga, ON, Canada L4Z 3M6