



Neurosurgical Society of Australasia

Lumbar Spine Surgery

A guide for patients

Lumbar laminectomy, microdiscectomy and fusion are surgical procedures to relieve compression or "pinching" of spinal nerves in the lower or lumbar region of the back.

Pinched lumbar nerves can cause acute or chronic back and leg pain, numb or weak legs, and in the most serious cases, loss of bladder and bowel control.

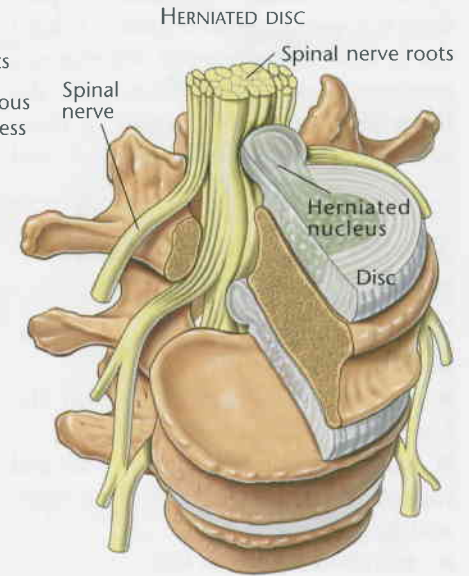
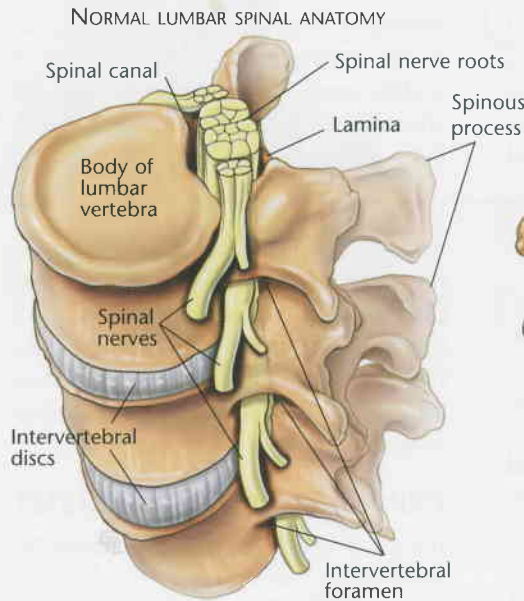
Anatomy of the spine: The nerves that carry information to and from the brain about sensation and movement in specific parts of your body form the spinal cord. The spinal cord travels from the base of the brain to the lumbar region through an opening in the centre of the spinal column called the spinal canal. The spinal cord divides into many spinal nerve roots. The lamina is part of the protective bony structure that surrounds the spinal canal.

The spinal column has 33 bony vertebrae. On the right and left of each vertebra, from the cervical to lumbar region, two branches of the spinal cord (called the dorsal root and ventral root) join to form each spinal nerve. Each spinal nerve courses through a hole between the vertebrae called the intervertebral foramen. It must be wide enough so that the nerve roots are not pinched.

Between each vertebra is an intervertebral disc. The normal disc has a thick wall (annulus) and is filled with a jelly-like inner core called the nucleus. Each disc acts as a shock absorber and helps to maintain proper spacing between vertebrae.

LUMBAR NERVE COMPRESSION

Compression of one or more lumbar spinal nerves can occur for a variety of



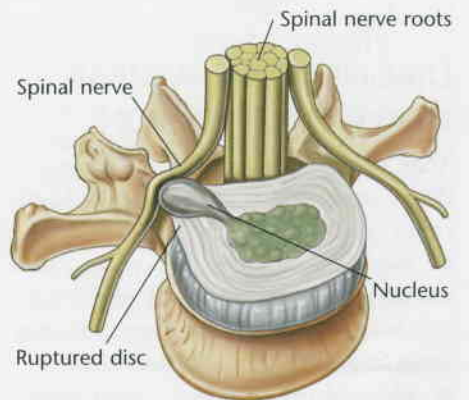
reasons, including trauma, a result of ageing, and other conditions.

Herniated disc: Another common cause of a pinched nerve is a herniated disc, also called a ruptured disc. When a disc herniates, the nucleus leaks out and may put pressure on a nerve root or spinal nerve (see illustration at right).

Spinal stenosis: As the spine ages, the annulus and nucleus of an intervertebral disc begin to lose strength, causing the disc to flatten and the ligaments to thicken. The result is that the spinal column settles. This settling causes the intervertebral foramen, through which the spinal nerve roots pass, to become smaller and smaller, until eventually a nerve root or the spinal nerve becomes pinched.

In addition, as the jelly-like nucleus ages, it no longer acts as an efficient shock absorber, and the vertebrae may rub against each other. This rubbing can

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When the nucleus leaks from the disc, a spinal nerve may become compressed.

Talk to your Surgeon

This pamphlet is intended to provide you with information. It is not a substitute for advice from your surgeon and does not contain all the known facts about spinal stenosis, herniated discs and surgical treatment.

If you are not sure about terms used in this pamphlet, or anything else, ask your doctor. Read this pamphlet carefully, and save it for future reference.

Some technical terms are used that may require further explanation by your surgeon. Write down questions you want to ask. Your surgeon will be pleased to answer them. You can seek the opinion of another surgeon if you are uncertain about advice that you are given. Use this pamphlet only in consultation with your surgeon.

Consent form: If you are having a surgical procedure, your surgeon will ask you to sign a consent form. Before signing, read it carefully. If you have any questions about it, ask your surgeon.

DEAR SURGEON: When you hand this pamphlet to your patient, remove this sticker and put it on the patient's medical history or card. This will remind you and your patient that this pamphlet has been provided. Some surgeons ask their patients to sign the sticker to confirm receipt of the pamphlet.

TREATMENT INFORMATION PAMPHLET

PROCEDURE:.....
PATIENT'S NAME:.....
DOCTOR'S NAME:.....
EDITION NUMBER:..... DATE: (day).....(month).....(year).....

cause the vertebral bone to grow, creating bone spurs that may constrict the spinal canal and intervertebral foramen, and cause compression of lumbar nerves.

Cauda equina syndrome: Cauda equina syndrome is a rare but serious result of compressed lumbar nerves. The cauda equina is a bundle of nerve roots formed from the spinal cord and located toward the bottom of the spine. They transmit messages between the brain and the lower limbs and pelvic organs. If these nerves become severely pinched and

damaged, paralysis and loss of bowel control and bladder control can occur. Cauda equina syndrome requires immediate surgery. If treatment is delayed, the risk increases of permanent damage to the nerve roots. Long-term recovery of nerve function may be poor or absent.

Risk factors: Spinal stenosis and herniated discs are most commonly due to the ageing spine. However, not all middle-aged and elderly people are affected. Some people are born with discs that are naturally plumper, and

some have wide intervertebral foramen and spinal canals, while other people are born with narrower openings. These factors, as well as weight, posture and level of physical activity, help to determine who is at greater risk of developing age-related back problems.

The main risk factors for degenerative changes of the spinal column include prior spinal or abdominal surgery, obesity, prior trauma, repetitive injury, and cigarette smoking.

SYMPTOMS OF LUMBAR NERVE COMPRESSION

The most common symptoms of lumbar nerve compression are:

- dull to severe aching pain in the lower back or buttocks
- sciatica – pain in the lower back and hip radiating down the back of the thigh and into the leg
- pain in one or both legs
- numbness and/or weakness of one or both legs.

DIAGNOSIS OF LUMBAR NERVE COMPRESSION

Your doctor may use the following to diagnose nerve compression and rule out other conditions:

- medical history – Tell your doctor about your symptoms and any injury, condition, or health problem you may have or medications you may take.
- physical examination – Your doctor will examine you to assess your strength, reflexes, ability to feel pain, and ability to move. Also, you may need to have blood tests.
- imaging – Diagnostic imaging tests such as computer tomography (CT),

magnetic resonance imaging (MRI), X-ray examination and myelograms can provide your surgeon with information about the anatomy of the nerve compression. One or more of these tests may be necessary to accurately diagnose the problem.

PRINCIPLES OF TREATMENT

If a spinal nerve is compressed, the treatment options are:

- time – To allow the damaged tissues to heal.
- medication – Corticosteroids and non-steroidal anti-inflammatory drugs (NSAIDs) may reduce inflammation and relieve pain. Analgesics may also be useful in relieving pain. However, the relief offered by medication tends to be temporary.
- physical therapy – When symptoms are not severe, physical therapy or mild exercise may improve muscle tone, fitness and flexibility. Physical therapy may also help to maintain movement in the spine.
- surgery – The two most common forms of surgery are:

1. laminectomy – removal of much of the bony arch (lamina) of a vertebra and

trimming of the facet joint, the bone that lies directly over the spinal nerve root.

2. microdiscectomy – partial removal of a disc, including the protruding part; some of the lamina may be removed.

Your general health and the severity of your symptoms are important factors in deciding whether surgery is an option.

In general, surgery is not an option when:

- you do not have pain or weakness in your legs
- your back and leg symptoms are not the result of a pinched nerve
- a medical reason prevents you from having surgery
- pain-relieving medication is sufficient, or
- physical therapy or exercise improve your condition.

In general, surgery is an option when you have a compressed spinal nerve and:

- leg pain that limits your normal daily activities
- weakness in your legs or feet
- numbness in your legs or feet
- difficulty walking or standing, or
- bowel or bladder control problems.

A DECISION ABOUT SURGERY

As you make the decision whether or not to have surgery, make sure that you understand the risks, benefits and limitations of surgery.

Only you can decide if surgery is right for you. If you have any questions, ask your surgeon.

There are also risks if you do not have surgery. If the compression of a spinal nerve or spinal root is not relieved, further damage to it may occur.

Then, in addition to pain and discomfort caused by a pinched nerve, numbness, paralysis and loss of bladder or bowel control may occur in some cases.

YOUR MEDICAL HISTORY

Your surgeon needs to know your medical history. Tell your surgeon about any health problems you might have. Some problems may interfere with treatment, surgery, anaesthesia or recovery. Before surgery, tell your surgeon if you have had:

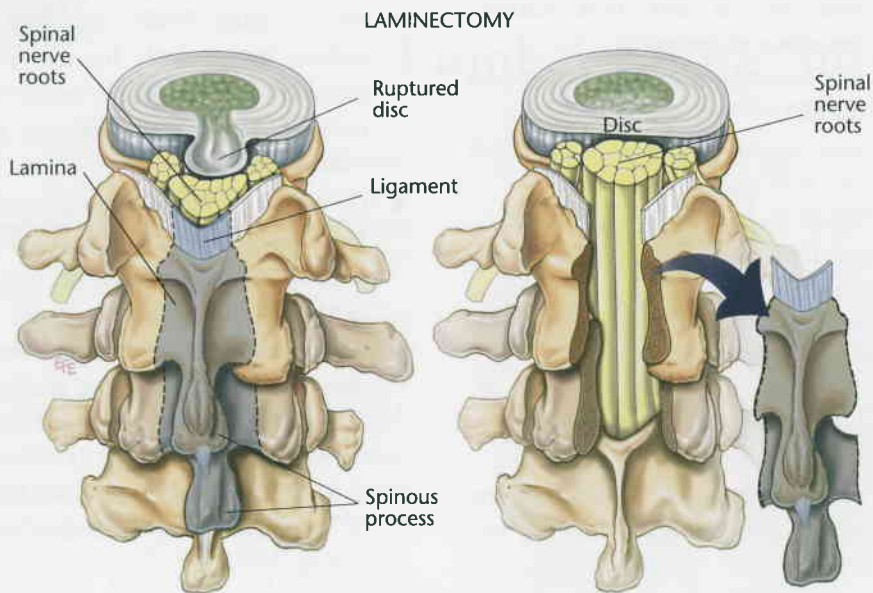
- an allergy or bad reaction to antibiotics, anaesthetic drugs or any other medicines, surgical tapes or dressings
- prolonged bleeding or excessive bruising when injured, or a family history of excessive bleeding
- recent or long-term illness, and any previous surgery.

Give your surgeon a list of ALL medi-

cines you are taking and have recently taken. Include medicines prescribed by your family doctor and those bought “over the counter” without prescription. Include long-term treatments such as blood thinners, aspirin (including that contained in cough syrups), arthritis medication or insulin. If you need surgical treatment, your doctor may ask you to stop taking some medications for a week or more before surgery, or you may be given an alternative dose.

Smoking: Patients who smoke must stop for at least three weeks before surgery and three weeks after surgery. It is best to quit because smoking interferes with healing.

Surgical Procedures of the Lumbar Spine



Lumbar laminectomy

The surgeon makes a five to 10-centimetre cut through the skin over the area of the spine where the nerve is compressed.

Surgical instruments are used to push aside fat and muscle until the spinal column can be seen. Using special instruments, the surgeon removes the spinous process.

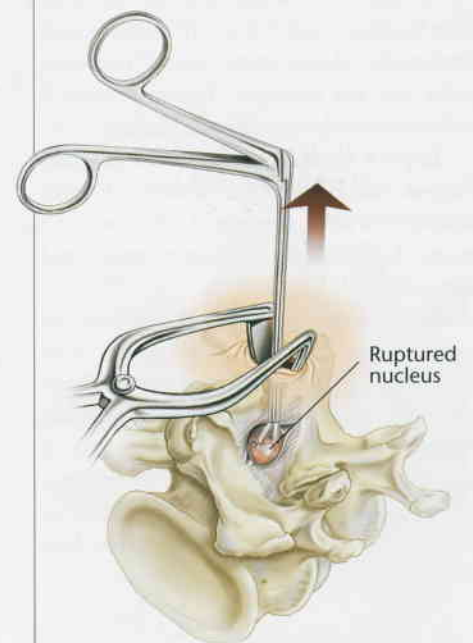
A fine drill is used to cut away all or part of the lamina, the bony arch over the spinal canal. This allows the surgeon to see the spinal canal and nerve roots.

The surgeon relieves pressure on the spinal nerve and nerve roots by:

- removing a bone spur
- enlarging the spinal canal, or
- widening the intervertebral foramen (foraminotomy) by trimming the facet joints (the bone that lies directly over the spinal nerve root) and the intervertebral disc which also lies next to the nerve root.

Spinal fusion

Occasionally, the surgeon needs to stop adjacent vertebrae from slipping over each another (spondylolisthesis), and they must be fused. To do this, the surgeon places bone-graft chips between the vertebrae to create a solid section of bone. Metal implants may be used to prevent any motion while the bone graft grows and strengthens.



The surgeon uses microinstruments to remove the ruptured nucleus and disc fragments that are compressing the spinal nerve roots.

Lumbar microdiscectomy

This procedure relieves compression of a spinal nerve or nerve root caused by a herniated disc. It is similar to a lumbar laminectomy but is less invasive. The incision is relatively small, usually about three centimetres.

To reveal the nerve and relieve pressure on it, the surgeon removes a small part of the facet joint, the bone that lies directly over the nerve root. The portion of the disc that is compressing the nerve is removed, along with other loose fragments.

The surgery normally takes one to two hours.

Prognosis

Following lumbar laminectomy, leg symptoms may improve in about 70 to 80 patients in 100. They are able to walk better and perform most normal daily activities. Most patients do have some degree of ongoing back pain and discomfort, even if minor. Numbness may improve.

The success rate for lumbar microdiscectomy is about 90 to 95 patients in 100 in relieving leg pain

but not back pain.

The degree of improvement is usually related to how long the patient had symptoms prior to surgery, and whether or not one or more spinal nerves have been damaged.

Unfortunately, if spinal nerve compression is due to ageing, symptoms may recur several years after surgery because the degenerative process continues. It may be necessary to have surgery again.

Anaesthesia

Lumbar laminectomy and microdiscectomy are usually performed under general anaesthesia. Modern anaesthesia does have risks, although the complication rates are low. Your anaesthetist can provide more information.

Give the anaesthetist a list of the medications you are taking. Make known any problems that you or a blood relative may have had with any anaesthetic.

Inform your anaesthetist about any heart disease, respiratory disease, diabetes, or any other medical condition.

AFTER THE SURGERY

You will wake up in the recovery area. When fully awake, you are taken to your hospital room where the nursing staff repeatedly check your blood pressure, pulse and leg strength. You may have a catheter to help empty your bladder.

Expect to have some pain at first. People have different levels of pain perception and tolerance. You will be given medication to relieve pain and discomfort.

With assistance, begin walking as soon and as often as possible. An hour after surgery, some patients may be able to walk a little. Walking helps to improve recovery and reduce the risk of blood clots in the deep veins of the legs (deep venous thrombosis, DVT). Most patients are discharged two to three days after surgery.

- You will be discharged when:
- your vital signs are stable
 - you can walk on your own
 - you can eat and drink without becoming nauseous
 - you have normal control over your bladder
 - your operated area is healing well and your recovery is normal.

Some discomfort in your legs may remain for a couple of days after surgery. This is due to swelling of the operated site. Anti-inflammatory drugs can help to relieve the discomfort.

RECOVERY AT HOME

- Minimise bending over.
- Put items that you must lift and carry between the level of your hip and shoulder.

- Do not carry anything heavy.
- Use slip on shoes with closed backs to make dressing easier.
- Exercise daily. Walks may help to reduce pain and hasten your recovery. Set reasonable goals, but gradually increase the distance you walk each day.
- Do not sit or stand for long periods. Make sure someone is around to help with chores and errands for one to two weeks after surgery.
- Rest when you need to, but don't sleep too much. Make sure you have a firm mattress because good back support is important. It is not unusual to wake up with a sore back. A short walk or warm shower may provide relief.

Possible Complications of Lumbar Laminectomy and Microdiscectomy

All surgical procedures are associated with some risk. Despite the highest standards of surgical practice, complications are possible.

It is not usual for a surgeon to dwell at length on every possible side effect or rare, but serious, complications of any surgical procedure. However, it is important that you have enough information to weigh up the benefits and risks of spinal surgery.

Most patients will not have complications, but if you have concerns about possible side effects, discuss them with your surgeon.

The following list of possible complications is intended to inform you, not to alarm you. There may be others that are not listed.

General risks of surgery

- Infection; antibiotic treatment may be necessary.
- Excessive bleeding; some patients may require a blood transfusion.
- A blood clot that develops in the legs (deep venous thrombosis) may travel to the lungs, causing pulmonary embolism. This complication is infrequent but can be life threatening.
- Allergic reaction to the anaesthetic.
- Unforeseen complications, such as pneumonia, stroke or heart attack, are not directly related to the surgery but could result in death, although this is rare.

Specific risks of lumbar laminectomy or microdiscectomy

- A tear in the thick tissue covering

the spinal nerve roots (dural tear) is the most common risk of lumbar laminectomy and microdiscectomy procedures. It may occur in about one out of 20 procedures. A tear in the membrane allows cerebrospinal fluid to leak out. The leak usually heals quickly after surgical repair done at the time of the original operation.

- A blood clot in the wound that requires drainage.
- Despite the great care taken by the surgeon, further damage to the spinal nerves may be caused by the surgery, in a very few cases. If the nerve root is already damaged, the surgery could increase the injury to the nerve, causing increased pain, numbness and weakness in the legs, and rarely loss of bladder and bowel function (incontinence), and impotence in males.

REPORT TO YOUR SURGEON

Contact your surgeon if you have any of these signs or symptoms after surgery:

- drainage or ooze from the incision
- redness or increasing pain at the incision
- stitches or staples come out
- the bandage becomes soaked with blood
- fever greater than 38°C
- increasing pain or numbness in your legs, back or buttocks
- pain, swelling or redness in one of your legs
- a severe headache
- if you have any questions or concerns.

Go immediately to the nearest hospital emergency department if you:

- have sudden shortness of breath, which may or may not be accompanied by chest pain (this could be a sign of a blood clot in the lungs, pneumonia or other heart and lung problems)
- lose control of your bowel or bladder, or if you are unable to urinate
- are unable to move your legs (this is a serious sign of spinal cord or spinal nerve compression).

Costs of Treatment

Your doctor should advise you about coverage by public health insurance, private health insurance and out-of-pocket costs. You may want to ask for an estimate that lists the likely costs. This includes costs for tests, examinations, hospital fees, medications and other matters related to diagnosis and treatments. Ask which costs can be claimed on health insurance.

As the cost of actual treatment may differ from the proposed treatment, the final account may vary from the estimate.

It is better to discuss costs with your doctor before treatment rather than afterwards.

Your Surgeon

