UZ LEUVEN

Lumbar decompression surgery: treatment of spinal stenosis

Patient Information

Introduction

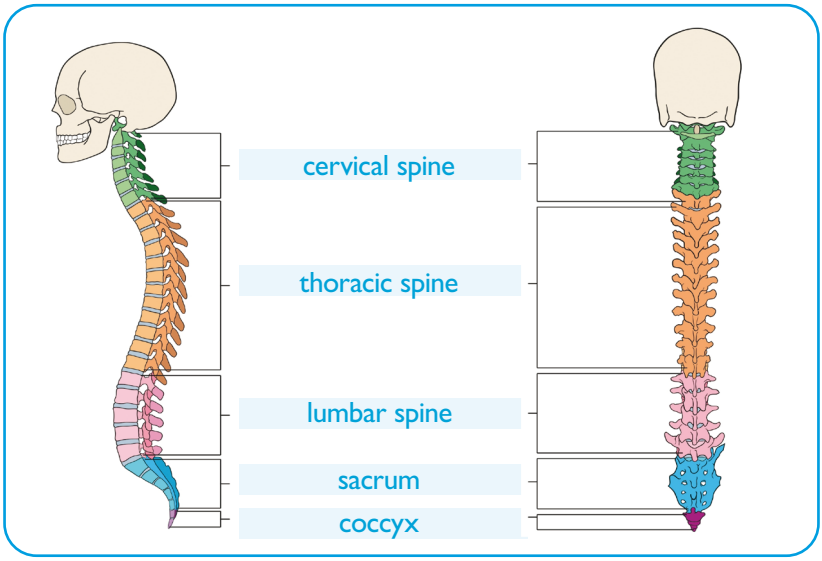
You are set to undergo surgery on the lower back to relieve pressure on the spinal canal. This brochure provides further information on the nature of the disorder, the purpose of the operation and the operation itself. It also includes an overview of the admission procedure and areas requiring specific attention once you are discharged from hospital. Finally, it includes a number of useful contact data you can refer to after you have been discharged from hospital.

The main areas that require attention during the first few days and weeks after the operation are included in the brochure entitled 'Lumbar spinal surgery: posture and movement discipline', which you should receive when you are admitted to hospital. If not, feel free to ask for one.

Should you have any further questions after reading this brochure, please do not hesitate to contact the doctor in charge of your treatment, the ward doctor or a nurse. Being well informed will make you feel more comfortable and less anxious, which will contribute to a smoother recovery process.

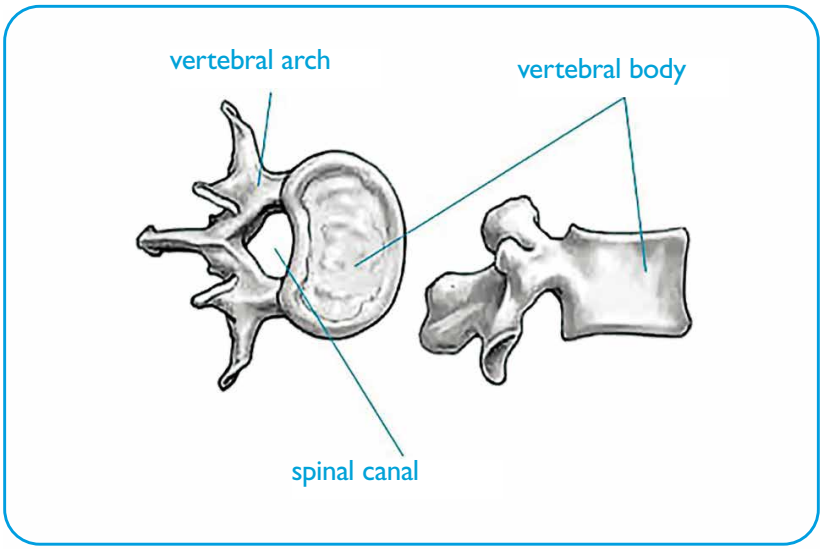
LUMBAR SPINE ANATOMY

The spine is built up of a number of individual vertebrae. Going from top to bottom there are seven cervical or neck vertebrae, twelve thoracic or chest vertebrae, and five lumbar vertebrae. The sacrum is located below the lumbar vertebrae and below that the coccyx (see illustration below). The lumbar spine is also referred to as the lower back.



Side and rear view of the spine

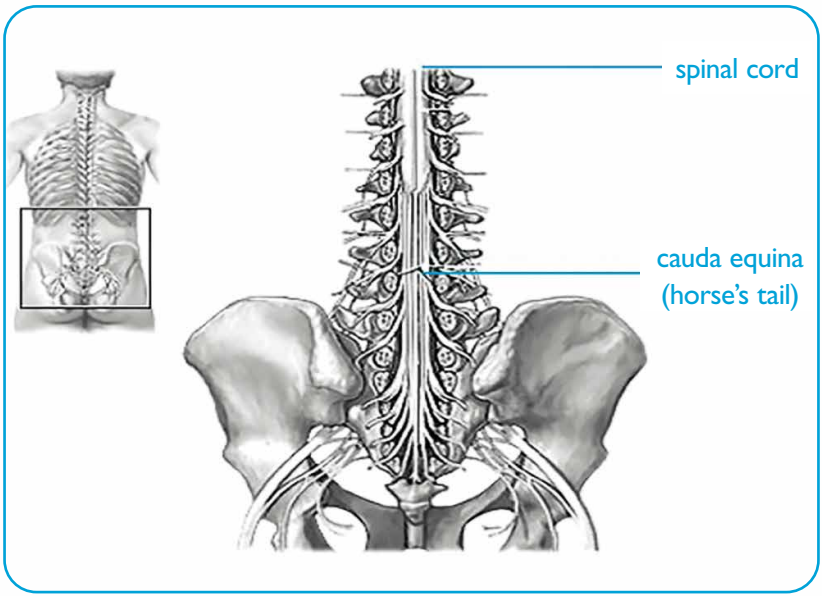
A **lumbar vertebra** consists of a vertebral body and a vertebral arch. The vertebral arch has two **transverse processes**, four joint surfaces that make contact with the adjacent vertebrae, a lamina that protects the back of the spine and a spinous process that can be felt through the skin at the back. Together the vertebral body and vertebral arch enclose a circle shaped opening (see illustration below). Stacked together the vertebrae thus create a channel: **the spinal canal**.



Top view (left) and side view (right) of a lumbar vertebra

The **cauda equina** (so-called horse's tail), a bundle of spinal nerves running down from the spinal cord, is located in this canal at the level of the lower lumbar spine.

Below the vertebral arch on each vertebra a nerve root protrudes on both sides (see illustration below). **Intervertebral discs** between adjacent vertebrae act as a shock absorber and joint. Intervertebral discs consist of a tough fibrous cartilage exterior (annulus fibrosus) and a soft, gel like core (nucleus pulposus). Various connective tissue structures are located between the vertebral arches and contribute to the stability of the spine: the yellow ligament (ligamentum flavum) between the laminae and ligaments between the spinous processes.



Cauda equina and protruding nerves

WHAT IS LUMBAR SPINAL STENOSIS AND WHEN IS SURGERY NECESSARY?

Because humans walk upright the entire weight of the torso is supported by the lumbar vertebrae and the transition from the lumbar spine to the sacrum. The vertebrae and intervertebral discs in the lower back are consequently subject to considerable mechanical stress. That is why these structures are most prone to wear and tear, or degenerate. In other words: sooner or later everyone will suffer some form of degeneration or deterioration in that part of the back. This process of wear and tear, which is usually age related, sometimes leads to thickening of ligament structures such as the yellow ligament and joints between the vertebrae. Moreover, the intervertebral disc may also be subject to wear and tear, resulting in it protruding from the spinal canal and potentially leading to a herniated disc.

The net result of this process of wear and tear is narrowing of the spinal canal, which is referred to as spinal stenosis. This stenosis may be limited to one level in the back or one side only, but can also affect several levels on both the left and right hand sides. Spinal canal stenosis most frequently occurs between the third and fourth lumbar vertebrae (L3-L4) or between the fourth and fifth lumbar vertebrae (L4-L5). A consequence of stenosis is that the nerves of the cauda equina, which run through this spinal canal, have restricted space. In a more advanced stage they are completely compressed.

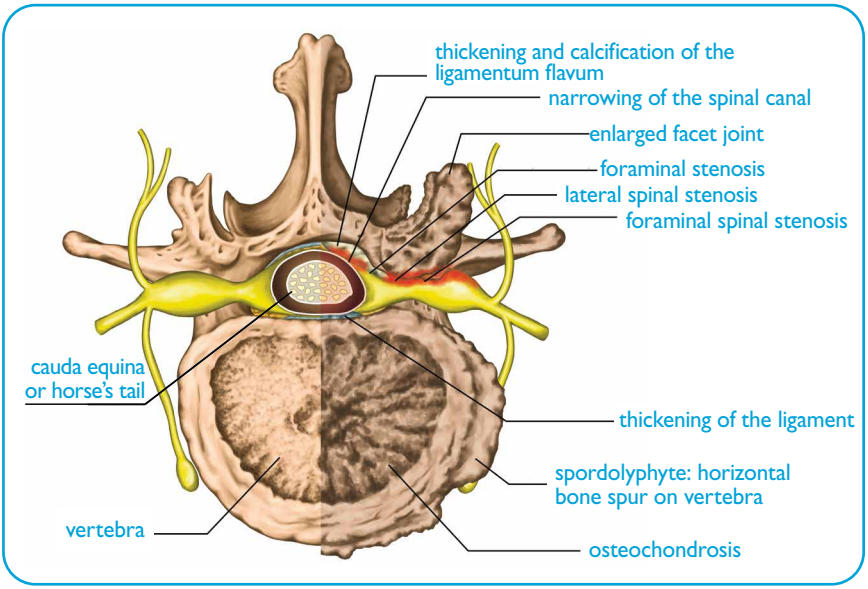


Illustration of a cross section of a lumbar vertebra with the spinal canal, the cauda equina and a protruding nerve root on both sides. A normal spinal canal is shown on the left; on the right a narrowed or stenosis spinal canal.

The symptoms associated with lumbar canal stenosis are referred to as 'neurogenic claudication', which means that pain radiates from the back into one or both legs, sometimes even as far as the toes. In typical cases this pain occurs following walking (several dozen or several hundred metres) or standing for a long time. It often improves quite quickly when the sufferer sits or lies down. Cycling or walking bent slightly more forward is often also less painful. As a result patients are often forced to reduce the distance they

can walk, which can have a significant impact on their day to day activities. In more serious cases there may be loss of strength or even problems urinating or passing stools. However, this is quite rare with a straightforward canal stenosis and tends to occur more often with an acute herniated disc.

If the symptoms are moderate non surgical treatment, consisting of painkillers and physiotherapy, will be suggested. If the pain is too severe it may be decided to resort to an epidural infiltration procedure, during which an anaesthetic and cortisone are injected into the site of the nerve root. If the symptoms persist or affect the patient's day to day activities, surgery may be considered. An operation of this kind aims to widen the spinal canal to create enough space again for the nerve roots of the cauda equina.

If the spinal canal is not stable or vertebrae have shifted, stabilisation or fixing together of two or more vertebrae may sometimes be required in addition to the decompression procedure. This is referred to as a lumbar fusion operation. In your case only the spinal canal will be widened as the above-mentioned type of operation is not necessary or appropriate.

PLANNING OF ADMISSION TO HOSPITAL

If a decision is made to proceed with an operation to treat the spinal canal stenosis, you will be referred to the anaesthesia unit for a preoperative examination. You will have to complete a questionnaire in preparation for this consultation, which relates to potential allergies and other disorders, your lifestyle and previous operations you may have had. It would be useful to take a summary of any medication you are taking and results of recent blood, heart or lung examinations to the consultation so that the anaesthetist can check them. If you have a blood group card, you should also take that with you. It is important that you visit the anaesthesia unit before your admission to ensure that this process runs as smoothly as possible.

During the consultation the doctor will run through the questionnaire with you. Your general health will be checked; the type of anaesthesia and pain management, and any potential risks, will be discussed with you. The doctor will also tell you which medication you can or cannot take prior to the operation.

If necessary additional examinations may be carried out. If they cannot be done immediately, you will be given an appointment for them.

Once the anaesthetist gives their approval your admission date will be confirmed, usually in writing.

YOUR ADMISSION TO THE WARD

Usually you will be admitted to the ward in the afternoon on the day before, or on the morning of the operation.

We would ask that you only bring essential items to the hospital because storage space is at a premium on the ward. Valuable items should be left at home.

It is advisable to bring the following:

- ✔ Any medication you are currently taking in its original packaging, which the nursing staff will look after on your behalf.
- ✔ Comfortable clothing allowing free movement during exercises on the ward and to go home in.
- ✔ Nightwear, dressing gown
- ✔ Sturdy, enclosed slippers or sports shoes
- ✔ Toiletries, towels and face cloths
- ✔ Razor
- ✔ Books and/or magazines
- ✔ Loose change, for example, to buy magazines
- ✔ Charger for your mobile phone
- ✔ Insurance certificate

Preparation for the operation:

- ✔ The hair on your back will be shaved by the nurse on the ward or in the operating theatre. Your skin has to be as smooth as possible to ensure that it is properly disinfected before the operation. You must not shave these parts of your body yourself.
- ✔ Shower before the operation using ordinary soap. The nurse will be able to assist you.
- ✔ The following drinks are ok up to 2 hours before the operation:
  - water
  - smooth fruit juice
  - carbohydrate drinks
  - carbonated drinks
  - tea or black coffee
- ✔ Six hours before the operation you must stop taking in any solid foods or drinks other than those mentioned above. Ask the nurse or ward doctor when the operation should normally start in order to avoid it having to be postponed.

Just before the operation:

- ✔ Remove jewellery, glasses, contact lenses, make-up, dentures, hearing aids, piercings and, where applicable, a wig, place them in the cabinet in your room and give the key to the nurse.
- ✔ You will be given a hospital gown.
- ✔ The nurse will check that you have an identification tag around your wrist.
- ✔ The nurse will tell you which medication you can still take before the operation (with a sip of water).
- ✔ You will then be taken to the operating theatre.

PROGRESS OF THE OPERATION

The purpose of the operation is to widen the spinal canal, thus removing the stenosis and creating space again for the nerve roots in the spinal canal. This type of operation is conducted using optical enlargement at UZ Leuven.

Once you have been taken to the operating theatre the anaesthetist will put you under general anaesthetic.

Preventive antibiotics are always administered for a lumbar canal stenosis.

Once under general anaesthetic, you will be turned over and placed on a knee bench so that you are supported by your ribcage and knees throughout the operation, allowing the surgeon to operate on your lower back. The surgeon will then use radioscopy to identify the correct intervertebral disc level and mark the skin on your back accordingly. Your back will then be disinfected and sterile covers applied. The surgeon will make an incision in the skin on the midline between the upper and lower vertebral arch to gain access to the spinal canal. Using optical enlargement a small section of the spinal canal will be opened up. The surgeon will now be able to see the narrowing of the spinal canal. He/she will then remove the thickened yellow ligament and part of the thickened joint between the vertebrae. This is the so-called decompression process in which a small drill and surgical tongs are used. This will bring the nerve roots into view. The surgeon will continue to expand the decompression area until the nerve roots at the level being operated on have been sufficiently freed. Where applicable, a herniated disc will be inspected and if necessary also removed.

Depending upon the extent of the problem, the other side of the spinal canal may also be opened up or the pressure may be relieved at several levels.

Once the decompression process is complete the wound will be re-attached layer by layer. Sometimes a wound drain may be inserted. This is a thin tube connected to a Redon bottle, which collects any surplus blood or secretions from the wound once the skin has been re-attached.

Once the operation is finished the anaesthetist will wake you up and you will be taken to the recovery room (PAZA or post-anaesthesia care unit).

AFTER THE OPERATION

After the operation you will be kept in the recovery room (PAZA or post-anaesthesia care unit) for observation and subsequently taken back to the ward.

Pain management is very important for your recovery. We would ask that during your admission you tell us if you are in pain or suffering persistent pain despite having been given painkillers. Correct pain management reduces the risk of complications and ensures a smoother recovery process.

In most cases you will be able to sit up again immediately after the operation and be allowed to move around quite quickly. The first time you will be supervised by a nurse or physiotherapist, who will also give you instructions on how to move correctly during the first few weeks after the operation.

If a wound drain was inserted, it will be removed one or two days after the operation upon advice from the surgeon.

Usually Clexane® 40 mg will be administered once a day after the operation. This medication protects against thrombosis (DVT), i.e. blood clots in the leg.

Providing there are no complications, you will usually be allowed to go home the first or second day after the operation. Obviously, this will vary depending on the speed of your recovery after the operation.

When you are discharged from hospital the ward doctor will provide you with the following:

- A letter for your GP containing a brief, preliminary report of the operation and your stay in hospital.
- A letter addressed to you detailing any medication you may have to take (e.g. painkillers). If you also have to take other medication we will provide you with a small amount of this medication so you don't have to go to the pharmacy on the day you are discharged. If necessary we will give you a prescription for the pharmacy.
- A letter detailing your check-up appointment with the surgeon who treated you. Where necessary, this may be preceded by a medical imaging appointment in order to check your recovery process. This usually happens about four to six weeks after your discharge from hospital. Following on from this check-up a consultation may be arranged with the doctor at the physical medicine and rehabilitation unit, to help determine the most appropriate rehabilitation programme after the operation. Depending on a number of variables, a period of 4 to 6 weeks of incapacity for work will be prescribed.
- A brochure entitled 'Lumbar spinal surgery: posture and movement discipline' ('Lumbale wervelkolomchirurgie: houdings- en bewegingsdiscipline').

POTENTIAL COMPLICATIONS

Lumbar canal stenosis surgery is quite common and in most cases proceeds without any complications. The following is a summary of the main discomforts and complications that might occur. This brochure is not intended to provide a full summary of any possible (rare) complications.

NERVE DAMAGE

Because the operation is conducted near the nerves in the spinal canal, patients sometimes fear it may result in paralysis. However, the risk of nerve damage is very small (< 1%). If it does happen, it might result in a specific muscle losing some of its strength.

INFECTION

An infection at the operating site, particularly if an intervertebral disc was operated on, is also rare (< 1%). If an infection does occur antibiotics will have to be administered long term. A single dose of antibiotics is, therefore, administered with any canal stenosis related back operation.

HAEMORRHAGING AFTER THE OPERATION

Haemorrhaging at the operating site urgently requiring another operation is very rare.

TORN MEMBRANES

Sometimes a tear may occur in the membranes around the cauda equina or nerve root, resulting in cerebrospinal fluid leaking from the back into the operating site. A leak of this kind is immediately sealed during the operation. To prevent further leakage after the operation your surgeon will usually ask you to remain lying down for at least 24 hours. The risk of this kind of tear in a membrane is less than 5% with a first operation. It is higher with a second or third operation at the same vertebral level due to scarring and adhesions. Leakage of cerebrospinal fluid into the wound following an operation that requires another operation to seal the leak is very rare.

The chances of improvement or disappearance of the radiating pain during walking are considerable with this type of operation. The impact of an operation on back pain, however, is more difficult to predict. Back pain may be alleviated after the operation, but it may also still be there or, in rare cases, actually get worse.

WHEN SHOULD YOU MAKE CONTACT?

As explained above, the risk of serious complications is very small.

However, you should contact our department in the following instances:

- ✔ New or worsening signs of neurological complications such as
  - loss of strength in the legs
  - loss of feeling or abnormal sensations in the legs or pubic area
  - problems walking, feeling of instability
  - problems urinating or passing stools
- ✔ Worsening back pain
- ✔ Wound problems (e.g. secretions, blood loss, swelling, redness, opening of wound edges)
- ✔ Fever during the first 3 weeks after the operation

Obviously, you can always contact the nursing unit should you be worried for any other reason.

The hospital has a 24/7 emergency service, which is manned even at night and at weekends and can be contacted concerning spinal problems. Or, in the event of acute problems, you can go directly to our A&E department.

USEFUL CONTACT DATA

Doctor on call for spinal problems (via central switchboard)	tel. 016 33 22 11
A&E UZ Leuven Gasthuisberg Campus	tel. 016 34 39 00
Neurosurgery Department	tel. 016 34 45 20
Orthopaedics Department	tel. 016 33 81 10
Neurosurgery Secretariat	tel. 016 34 42 90
Orthopaedics Secretariat	tel. 016 33 88 27

NOTES

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