

Lumbar Discectomy

Overview

Lumbar discectomy is a surgery to remove a herniated or degenerative disc in the lower spine. The incision is made posterior, through the back muscles, to remove the disc pressing on the nerve. Discectomy may be recommended if physical therapy or medications fail to relieve leg or back pain or if you have signs of nerve damage, such as weakness or loss of feeling in your legs. The surgery can be performed in an open or minimally invasive technique.

What is lumbar discectomy?

Discectomy literally means "cutting out the disc." A discectomy can be performed anywhere along the spine from the neck (cervical) to the low back (lumbar). The surgeon reaches the damaged disc from the back (posterior) of the spine—through the muscles and bone. The surgeon accesses the disc by removing a portion of the lamina. The lamina is the bone that forms the backside of the spinal canal and makes a roof over the spinal cord. Next, the spinal nerve is retracted to one side. Depending on your particular case, one disc (single-level) or more (multi-level) may be removed.

A variety of surgical tools and techniques can be used to perform a discectomy. An "open" technique uses a large skin incision and muscle retraction so that the surgeon can directly view the area. A "minimally invasive" technique or a microendoscopic discectomy uses a small skin incision. A series of progressively larger tubes, called dilators, are used to tunnel through the muscles. Special instruments help the surgeon see and operate in a smaller space. A minimally invasive incision causes less disruption of the back muscles and may decrease recovery time. Your surgeon will recommend the technique most appropriate for your specific case.

A fusion may be done at the same time as discectomy to help stabilize the spine for patients who are athletes, perform heavy labor, or have spinal instability. Fusion uses a combination of bone graft and hardware (screws/plates) to connect two vertebrae together. During the healing process, the two vertebrae fuse into one piece of bone. Fusion is rarely needed for a herniated lumbar disc [1].

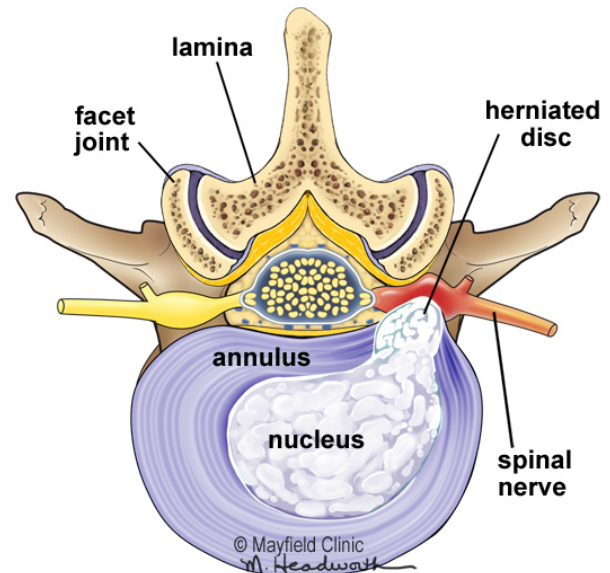


Figure 1. A herniated disc occurs when the gel-filled nucleus escapes through a tear in the disc annulus and compresses the spinal nerve causing pain and swelling.

Who is a candidate?

You may be a candidate for discectomy if you have:

- diagnostic tests (MRI, CT, myelogram) that show a herniated disc
- significant pain, weakness, or numbness in your leg or foot
- leg pain (sciatica) worse than back pain
- symptoms that have not improved with physical therapy or medication
- leg weakness, loss of feeling in the genital area, and loss of bladder or bowel control (cauda equina syndrome)

Posterior lumbar discectomy may be helpful in treating leg pain caused by:

- **Bulging or herniated disc:** The gel-like material within the disc can bulge or rupture through a weak area in the surrounding wall (annulus). Irritation and swelling occurs when this material squeezes out and painfully presses on a nerve (Fig. 1).
- **Degenerative disc disease:** As discs naturally wear out, bone spurs form and the facet joints inflame. The discs dry out and shrink, losing their flexibility and cushioning properties. The disc spaces get smaller. These changes lead to stenosis or disc herniation.

The surgical decision

Most herniated discs heal after a few months of nonsurgical treatment. Your doctor may recommend treatment options, but only you can decide whether surgery is right for you. Be sure to consider all the risks and benefits before making your decision. Only 10% of people with herniated disc problems have enough pain after 6 weeks of nonsurgical treatment to consider surgery.

Who performs the procedure?

A neurosurgeon or an orthopedic surgeon can perform spine surgery. Many spine surgeons have specialized training in complex spine surgery. Ask your surgeon about their training, especially if your case is complex or you've had more than one spinal surgery.

What happens before surgery?

In the doctor's office, you will sign consent and other forms so that the surgeon knows your medical history (allergies, medicines/vitamins, bleeding history, anesthesia reactions, previous surgeries). Discuss all medications (prescription, over-the-counter, and herbal supplements) you are taking with your health care provider. Presurgical tests (e.g., blood test, electrocardiogram, chest X-ray) may need to be done several days before surgery. Consult your primary care physician about stopping certain medications and ensure you are cleared for surgery.

Continue taking the medications your surgeon recommends. Stop taking all non-steroidal anti-inflammatory medicines (ibuprofen, naproxen, etc.) and blood thinners (Coumadin, aspirin, Plavix, etc.) 7 days before surgery. Stop using nicotine and drinking alcohol 1 week before and 2 weeks after surgery to avoid bleeding and healing problems.

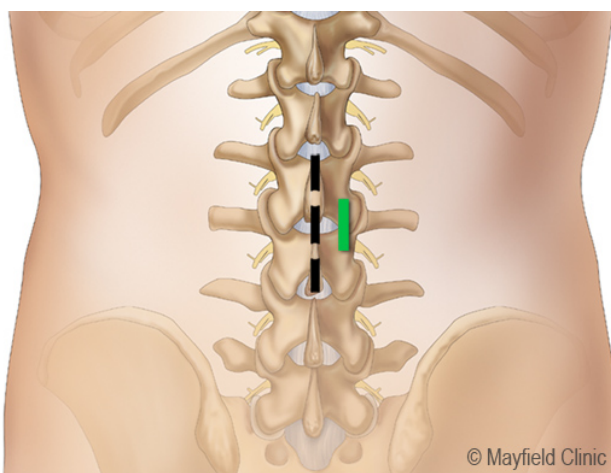


Figure 2. For an open discectomy, a 1- to 2-inch skin incision (black line) is made down the middle of your back. Muscles overlying the vertebrae are retracted to one side. For a minimally invasive discectomy, a small stab entry (green line) is made in the skin near the midline.

You may be asked to wash your skin with Hibiclens (CHG) or Dial soap before surgery. It kills bacteria and reduces surgical site infections. (Avoid getting CHG in eyes, ears, nose or genital areas.)

Morning of surgery

- Don't eat or drink after midnight before surgery (unless the hospital tells you otherwise). You may take permitted medicines with a small sip of water.
- Shower using antibacterial soap. Dress in freshly washed, loose-fitting clothing.
- Wear flat-heeled shoes with closed backs.
- Remove make-up, hairpins, contacts, body piercings, nail polish, etc.
- Leave all valuables and jewelry at home.
- Bring a list of medications (prescriptions, over-the-counter, and herbal supplements) with dosages and the times of day usually taken.
- Bring a list of allergies to medication or foods.

Arrive at the hospital 2 hours before (surgery center 1 hour before) your scheduled surgery time to complete the necessary paperwork and pre-procedure work-ups. An anesthesiologist will talk with you and explain the effects of anesthesia and its risks.

What happens during surgery?

There are five steps of the procedure. The operation generally lasts 1 to 2 hours.

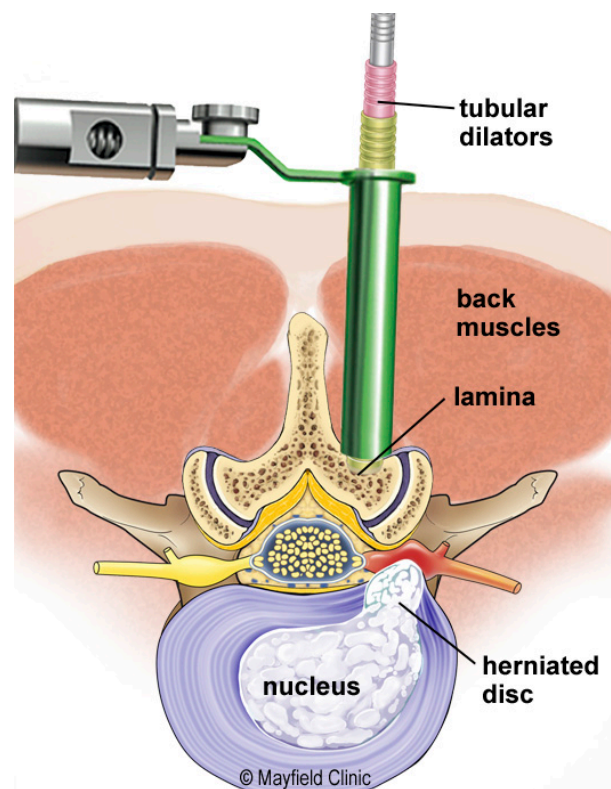


Figure 3. For a minimally invasive discectomy, the muscles are dilated gradually with increasingly larger tubular retractors to gain access to the bony lamina.

Step 1: prepare the patient

You will lie on your back on the operative table and be given anesthesia. Once asleep, you are rolled onto your stomach with your chest and sides supported by pillows. The area where the incision will be made is cleansed and prepped.

Step 2: make an incision

With the aid of a fluoroscope (a special X-ray), the surgeon passes a thin needle through the skin down to the bone to locate the affected vertebra and disc.

In an open discectomy, a skin incision is made down the middle of your back over the affected vertebrae (Fig. 2). The length of the incision depends on how many discectomies will be performed. A single-level incision is about 1 to 2 inches long. The back muscles are retracted on one side to expose the bony vertebra. An X-ray is taken to verify the correct vertebra.

In a minimally invasive discectomy, a small incision (less than 1 inch) is made to one side of your back (Fig. 3). Next, a series of progressively larger dilators are passed, one around the other, to gradually separate the muscles and create a tunnel to the bony vertebra.

Step 3: make a laminotomy

Next, a small opening of the lamina, above and below the spinal nerve, is made with a drill or bone-biting tools (Fig. 4). A laminotomy can be done on one (unilateral) or both (bilateral) sides, or on multiple vertebrae levels.

Step 4: remove the disc fragments

With the lamina removed, the surgeon gently retracts the protective sac of the nerve root. The surgeon looks through a surgical microscope to find the herniated disc. Only the ruptured portion of the disc is removed to decompress the spinal nerve root. The entire disc is not removed (Fig. 5). Bone spurs or a synovial cyst that may press on the nerve root are also removed.

For a single-level lumbar discectomy, fusion is rarely performed. However, other conditions, such as recurrent disc herniation or spinal instability, may be treated with a fusion.

Step 5: close the incision

The retractor holding the muscles is removed. The muscle and skin incisions are sewn together with sutures. The incision is closed with skin glue.

What happens after surgery?

You will awaken in the postoperative recovery area. Blood pressure, heart rate, and respiration will be monitored. Any pain will be addressed. Once awake, you can begin gently movement (sitting in a chair, walking). Most patients can go home the

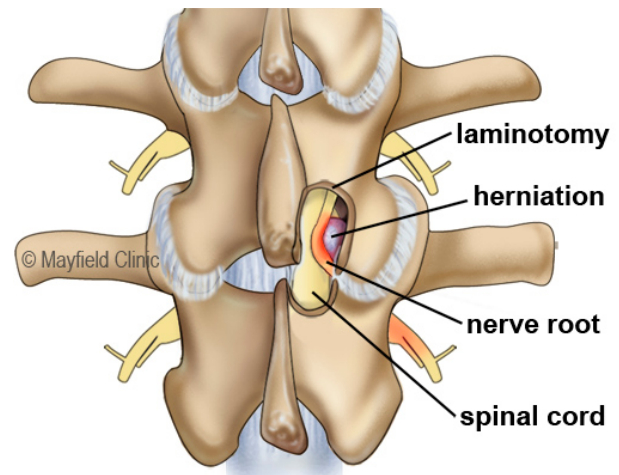


Figure 4. A laminotomy makes a small window by removing bone of the lamina above and below. The nerve root and spinal cord can be gently reflected to expose the herniated disc.

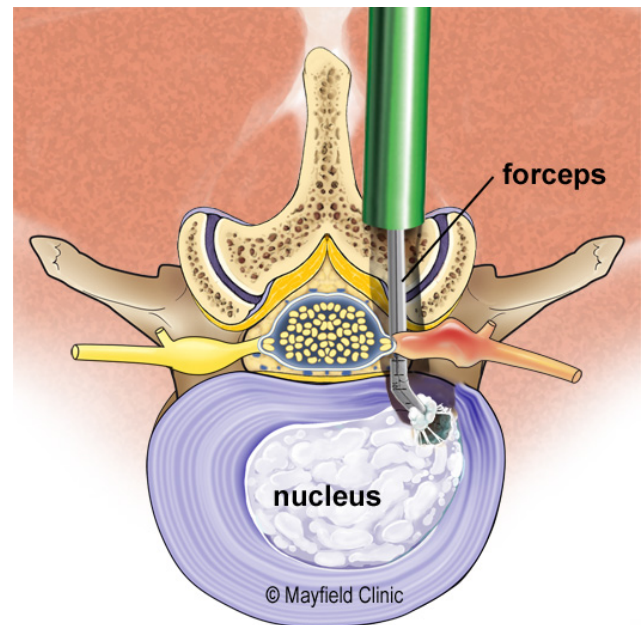


Figure 5. The herniated disc material compressing the nerve root is removed.

same day. Other patients can be released from the hospital in 1 to 2 days. Be sure to have someone at home to help you for the first 24 to 48 hours.

Follow the surgeon's home care instructions for 2 weeks after surgery or until your follow-up appointment. In general, you can expect:

Restrictions

- Avoid bending or twisting your back.
- Don't lift anything heavier than 5 pounds.
- No strenuous activity including yard work, housework, and sex.

- Don't drive the first 2-3 days or while taking pain medicines or muscle relaxers. If your pain is well controlled, you can drive.
- Don't drink alcohol. It thins the blood and increases the risk of bleeding. Also, don't mix alcohol with pain medicines.

Incision Care

- If Dermabond skin glue covers your incision, you may shower the day after surgery. Gently wash the area with soap and water every day. Don't rub or pick at the glue. Pat dry.
- If you have staples, steri-strips or stitches, you may shower 2 days after surgery. Gently wash the area with soap and water every day. Pat dry.
- If there is drainage, cover the incision with a dry gauze dressing. If drainage soaks through two or more dressings in a day, call the office.
- Don't soak the incision in a bath or pool.
- Don't apply lotion/ointment on the incision.
- Dress in clean clothes after each shower. Sleep with clean bed linens. No pets in the bed until your incision heals.
- Staples, steri-strips, and stitches are removed at your follow-up appointment.

Medications

- Take pain medicines as directed by your surgeon. Reduce the amount and frequency as your pain subsides. If you don't need the pain medicine, don't take it.
- Narcotics can cause constipation. Drink lots of water and eat high-fiber foods. Stool softeners and laxatives can help move the bowels. Colace, Senokot, Dulcolax and Miralax are over-the-counter options.

Activity

- Ice your incision 3-4 times per day for 15-20 minutes to reduce pain and swelling.
- Don't sit or lie in one position longer than an hour unless you are sleeping. Stiffness leads to more pain.
- Get up and walk 5-10 minutes every 3-4 hours. Gradually increase walking, as you are able.

When to Call Your Doctor

- Fever over 101.5° (unrelieved by Tylenol).
- Unrelieved nausea or vomiting.
- Signs of incision infection.
- Rash or itching at the incision (allergy to Dermabond skin glue).
- Swelling and tenderness in the calf of one leg.
- New onset of tingling, numbness, or weakness in the arms or legs.
- Dizziness, confusion, nausea or excessive sleepiness.

Recovery and prevention

Schedule a follow-up appointment with your surgeon for 2 weeks after surgery. Physical therapy may be necessary for some people.

The recovery time varies from 1 to 4 weeks depending on the underlying disease treated and your general health. You may feel pain at the site of the incision. The original pain may not be completely relieved immediately after surgery. Aim to keep a positive attitude and diligently perform your physical therapy exercises if prescribed.

Most people can return to work in 2 to 4 weeks or less with jobs that are not physically challenging. Others may need to wait at least 8 to 12 weeks to return to work for jobs that require heavy lifting or operating heavy machinery.

Recurrences of back pain are common. The key to avoiding recurrence is prevention:

- Proper lifting techniques
- Good posture during sitting, standing, moving, and sleeping
- Appropriate exercise program
- An ergonomic work area
- Healthy weight and lean body mass
- A positive attitude and relaxation techniques (e.g., stress management)
- No smoking

What are the results?

Good results are achieved in 80 to 90% of patients treated with lumbar discectomy [2,3]. In a study that compared surgery and nonsurgical treatment for herniated discs, the outcomes were [2]:

- People with leg pain (sciatica) benefit more from surgery than those with back pain.
- People with less severe or improving pain do well with nonsurgical treatment.
- People with moderate to severe pain who had surgery notice a greater improvement than those who did not have surgery.

Similarly, minimally invasive discectomy techniques have been shown to be comparable in outcomes with open discectomy [4]. While the benefits of minimally invasive approaches include shorter operative time, less blood loss and muscle trauma, and faster recovery, these newer techniques are not appropriate for all patients. Ask your surgeon if minimally invasive microendoscopic discectomy is appropriate for you.

Discectomy may provide faster pain relief than nonsurgical treatment. However, it is unclear whether surgery makes a difference in what treatment may be needed later on. About 5 to 15% of patients will have a recurrent disc herniation, either at the same side or the opposite side.

What are the risks?

No surgery is without risks. General complications of any surgery include bleeding, infection, blood clots, and reactions to anesthesia. If spinal fusion is done at the same time as a discectomy, there is a greater risk of complications. Specific complications related to a discectomy may include:

Deep vein thrombosis (DVT) is a potentially serious condition caused when blood clots form inside the leg veins. If the clots break free and travel to the lungs, lung collapse or even death is a risk. However, there are several ways to treat or prevent DVT. Get up and out of bed as soon as possible so your blood is moving and less likely to clot. Support hose and pulsatile stockings can keep the blood from pooling in the veins. Drugs, such as aspirin, Heparin, or Coumadin, may also be used.

Lung problems. Lungs need to be working their best after surgery to provide tissues with enough oxygen to heal. If the lungs have collapsed areas, mucus and bacteria build up can lead to pneumonia. Your nurse will encourage you to breath deeply and cough often.

Nerve damage or persistent pain. Any operation on the spine comes with the risk of damaging the nerves or spinal cord. Damage can cause numbness or even paralysis. However, the most common cause of persistent pain is nerve damage from the disc herniation itself. Some disc herniations may permanently damage a nerve making it unresponsive to decompression surgery (Fig. 6). In these cases, spinal cord stimulation or other treatments may provide relief. Be sure to go into surgery with realistic expectations about your pain. Discuss your expectations with your doctor.

Sources & Links

If you have more questions, please contact Mayfield Brain & Spine at 800-325-7787 or 513-221-1100.

Sources

- 1) Resnick DK, et al. Guidelines for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 8: lumbar fusion for disc herniation and radiculopathy. *J Neurosurg Spine* 2:673-78, 2005.
- 2) Atlas SJ, et al. Long-term outcomes of surgical and nonsurgical management of sciatica secondary to a lumbar disc herniation: 10-year results from the Maine Lumbar Spine Study. *Spine*, 30(8): 927-935, 2005.
- 3) Weinstien JN, et al. Surgical vs nonoperative

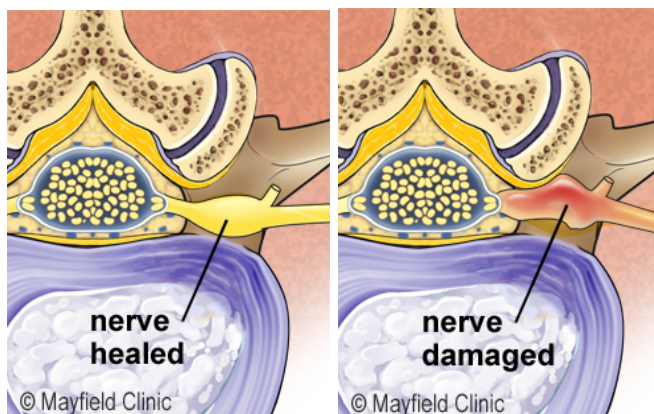


Figure 6. Several months after surgery, the disc wall and nerve root should repair and heal (left). However, sometimes the nerve is unable to repair itself fully (right) and some symptoms may persist despite removing the pressure off the nerve. This situation is similar to moving furniture off the carpet. Once the heavy couch is moved, the carpet fibers re-expand and look like new; other times the imprint is there forever.

treatment for lumbar disk herniation: the Spine Patient Outcomes Research Trial (SPORT): a randomized trial. *JAMA* 296:2441-50, 2006

- 4) Ryang YM, et al. Standard open microdiscectomy versus minimal access trocar microdiscectomy: results of a prospective randomized study. *Neurosurgery* 62:174-81, 2008.

Links

- <http://www.spine-health.com>
- <http://www.spineuniverse.com>
- <http://www.knowyourback.org>

Glossary

- annulus (annulus fibrosis):** tough fibrous outer wall of an intervertebral disc.
- discectomy:** a type of surgery in which herniated disc material is removed so that it no longer irritates and compresses the nerve root.
- fusion:** to join together two separate bones into one to provide stability.
- herniated disc:** a condition in which disc material protrudes through the disc wall and irritates surrounding nerves causing pain.
- lamina:** flat plates of bone originating from the pedicles of the vertebral body that form the posterior outer wall of the spinal canal and protect the spinal cord. Sometimes called the vertebral arch.
- spinal instability:** abnormal movement between two vertebrae that can cause pain or damage the spinal cord and nerves.



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