

LUMBAR SPINE SURGERY

Introduction

The goal of surgery is to relieve your symptoms, allowing you to return to normal activities—pain free. Your physician has discussed the best surgical procedure for your condition. Most spine surgeries involve a **posterior approach**, which means that the surgeon makes the incision in your back. However, for some surgeries the better access to the spine is through your abdomen: this is called an **anterior approach**.

Many varied procedures are used to relieve lumbar spine and leg pain. Most often surgery is performed to correct whatever is irritating, or compressing the affected spinal nerves. This is commonly referred to as **nerve decompression**. Below are some of the most common types of back surgery. Occasionally, there is a combination of these procedures in order to obtain the best outcome.

Laminotomy, Laminectomy, and Foraminotomy

The **lamina** is a part of the vertebral arch that makes up the back of the spinal canal (Figure 1). In order for the neurosurgeon to reach the injured disk and affected nerves, part of this bony area needs removed.

If only a small area of the lamina is extracted, the procedure is a **laminotomy**. Part of the lamina, both above and below the pinched nerve is removed. A **laminectomy** involves extracting the entire lamina. For some patients, a laminectomy may be necessary at two levels (i.e., two vertebrae). Most spine operations require either a laminotomy or a laminectomy, especially if the surgery is to relieve symptoms of a herniated disk. The surgeon first moves the nearby back muscle aside, and then removes the necessary amount of lamina in order to see the injured disk. The surgeon can then proceed to the disk, removing that part that is pressing on the nerve.

For some patients, a laminotomy or laminectomy may suffice in relieving the effects of the bulging disk or bone spurs. However, if stenosis is present, the neurosurgeon may enlarge the opening (foramen) between the vertebrae in order to allow more space for the nerve roots to exit the spine. This procedure is called **foraminotomy**.

Top View of Vertebra

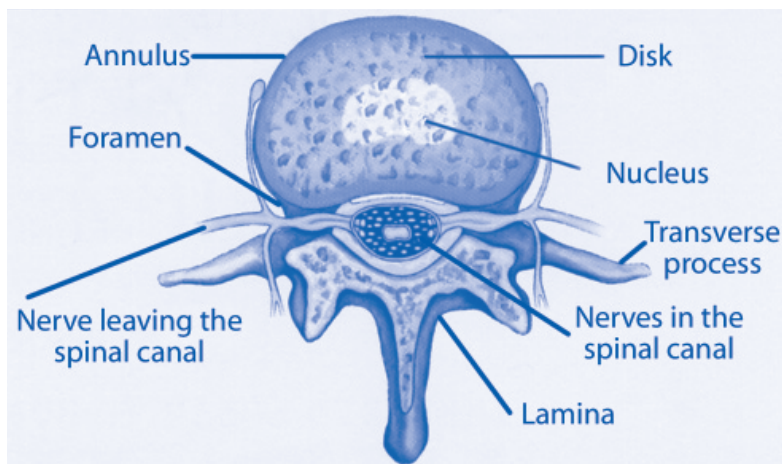


Figure 1. Laminectomy: Illustration shows the bony area (lamina) of the vertebral arch that is removed.

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Discectomy and Microdiscectomy

A *discectomy* involves the removal of a portion of the disc that is protruding and pressing on an irritated nerve. The surgery is performed under general anesthesia with the patient laying face down on the operating room table. A small incision is made in the middle of the spine at the level of the damaged disk. The lamina (the bone behind the disk) is removed, allowing the neurosurgeon to have direct access to the injured disk. The herniation is removed, as well as any other loose bone fragments or bone spurs (Figures 2 & 3).

Most often an operating microscope is used to magnify the spine surgery; thus the procedure is commonly referred to as a *microdiscectomy*. With a *microdiscectomy*, the patient has a small incision, about an inch in length. This results in less scarring and a quicker recovery. There is very little blood loss. Most patients have a one-night hospital stay and are discharged to home the next morning.

Lumbar Fusion

This neurosurgical procedure is performed on people with spine instability, to relieve the pressure on one or more nerve roots, or on the spinal cord. It involves the stabilization of two or more vertebrae by locking them together (fusing them). The fusion stops the abnormal vertebral motion and as a result, the pain is also stopped.

Anterior lumbar fusion refers to the front, meaning that the surgeon reaches the lumbar spine through a small incision in the abdomen. After retracting neck muscles, the neurosurgeon uses an operating microscope and removes the affected intervertebral disc, (Figure 4) which takes the pressure off the nerves or spinal cord. This is called **decompression**. He then replaces it with a bone graft that will fuse the vertebrae together over time (Figure 5).

A **bone graft** is a plug of bone that allows the fusion of bone to happen. It is obtained from a bone bank, which collects, treats, and stores bone. The bone comes from human donors who are recently deceased. This type of graft is referred to as allograft bone. The preformed bone plug is safe and will not be rejected by your body. It is *acellular*, meaning it contains no blood cells.

Posterior lumbar fusion refers to the back, meaning that the neurosurgeon reaches the spine through an incision made in the back, not the abdomen.



Figure 2



Figure 3

Figures 2 & 3 (above). The neurosurgeon creates a window and then removes the disc material that presses on the nerve.

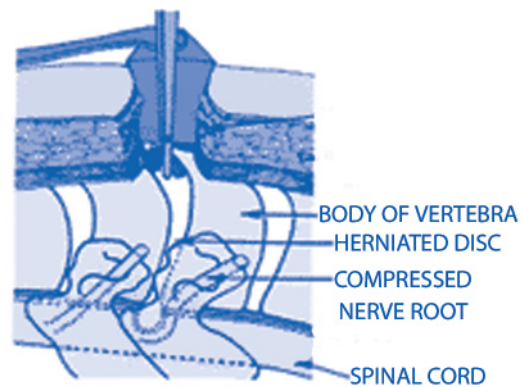


Figure 4. Using surgical instruments, the intervertebral disc is removed.

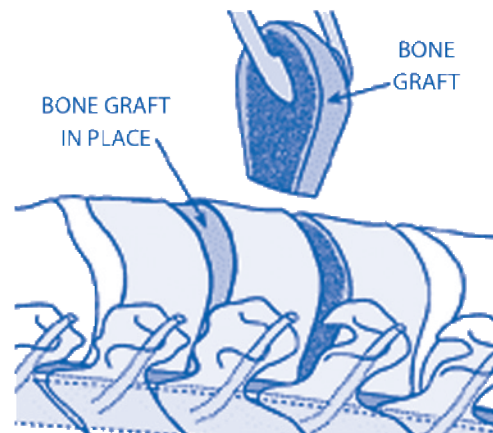


Figure 5. The bone graft is positioned into the open space, replacing the removed disc.

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Depending on the location of the damaged spine, the neurosurgeon chooses the appropriate parts of the vertebrae to fuse. For example, he may choose the disk space, the facets (joints of the vertebrae), or the transverse processes (the wing-looking parts of the vertebrae that extend outward). Usually no more than two lumbar vertebrae are fused.

In some cases, the neurosurgeon may use *instrumentation*. This terminology refers to metal implants (plates, screws, cages, rods, or pins) which are used to provide extra pressure and support to the lower back and to make sure that the bones fuse adequately. The neurosurgeon may use more than one form of instrumentation (Figures 6, 7 and 8).

A lumbar fusion procedure takes between two and six hours. The length of time depends upon the number of vertebrae involved, whether instrumentation is indicated, and other factors. After the surgery, you will be taken to the Recovery Room to wake up. From there you will be transferred to a surgical floor.

LUMBAR CAGE

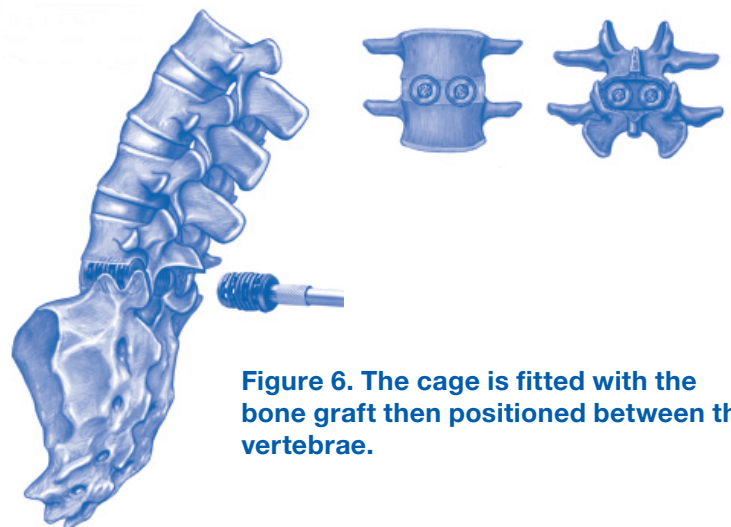


Figure 6. The cage is fitted with the bone graft then positioned between the vertebrae.

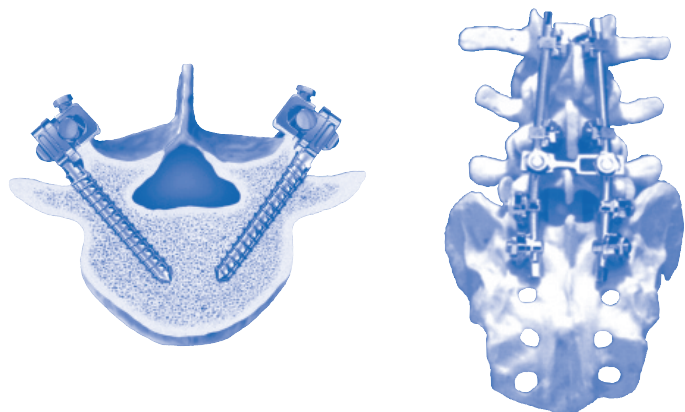


Figure 7. Screws alone may be effective in stabilizing the spine, or may be used in combination with metal rods.

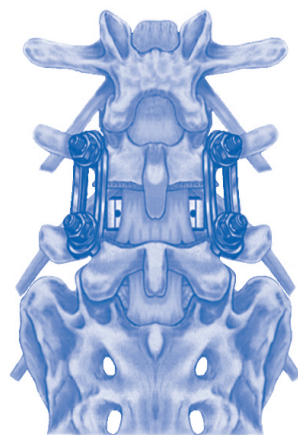


Figure 8.