A Patient's Guide to

Cervical Foraminotomy

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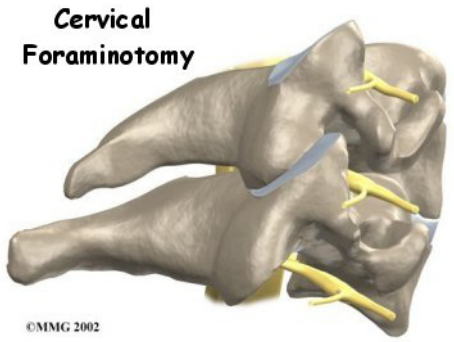


Introduction

Foraminotomy is a surgical procedure for widening the area where the spinal nerve roots exit the spinal column. A *foramen* is the opening around the nerve root, and *otomy* refers to the medical procedure for enlarging the opening. In this procedure, surgeons widen the passageway to relieve pressure where the spinal nerve is being squeezed in the foramen.

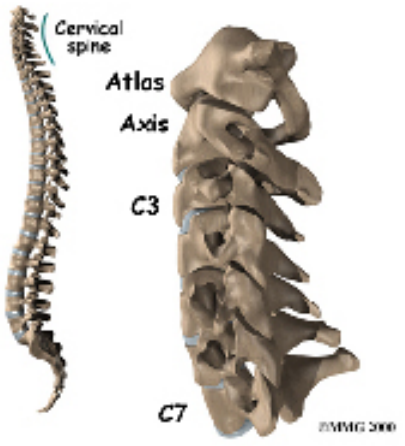
This guide will help you understand

- **why the procedure becomes necessary**
- **what surgeons hope to achieve**
- **what to expect during your recovery**

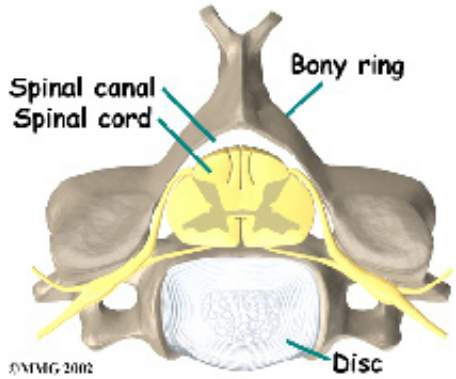
Anatomy

What parts of the neck are affected?

The spine is made of a column of bones. Each bone, or *vertebra*, is formed by a round block of bone, called a *vertebral body*. The *spinal canal* is a hollow tube formed by the bony rings of all the vertebrae. The spinal canal surrounds and protects the spinal cord within the spine. There are seven vertebrae in the neck that form the area known as the **cervical spine**. The vertebrae are separated by *intervertebral discs*.



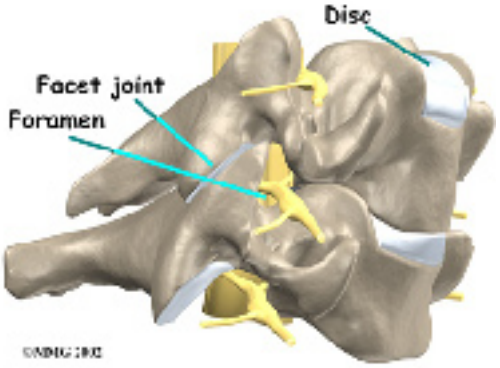
Cervical spine



Vertebra

Traveling from the brain down through the spinal column, the spinal cord sends out nerve branches through openings on both sides of each vertebra. These openings are called the *neural foramina.* (The term used to describe a single opening is *foramen*.)

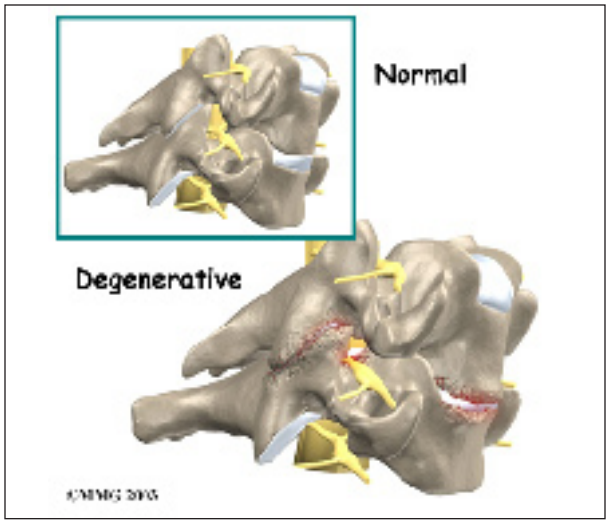
The intervertebral disc sits directly in front of the opening. A bulged or herniated disc can narrow the opening and put pressure on the nerve. A *facet joint* sits in back of the foramen. Bone spurs that form on the facet joint can project into the tunnel, narrowing the hole and pinching the nerve.



Rationale

What do doctors hope to achieve?

Foraminotomy alleviates the symptoms of *foraminal stenosis*. In foraminal stenosis, a nerve root is compressed inside the neural foramen. This compression is usually the result of *degenerative* (or wear and tear) changes in the spine.



Wear and tear from repeated stresses and strains on the neck can cause a spinal disc to begin to collapse. As the space between the vertebral bodies shrinks, the opening around the nerve root narrows. This squeezes the nerve. The nerve root is further squeezed in the foramen when the facet joint lining the outer edge of the foramen becomes inflamed and enlarged as a result of the same degenerative changes.

The degenerative process can also cause bone spurs to develop and point into the foramen, causing further irritation. In a foraminotomy, the surgeon removes the tissues around the edges of the foramen, essentially widening the opening in order to take pressure off the nerve root.

Preparations

How will I prepare for surgery?

The decision to proceed with surgery must be made jointly by you and your surgeon. You should understand as much about the procedure as possible. If you have concerns or questions, you should talk to your surgeon.

Once you decide on surgery, you need to take several steps. Your surgeon may suggest a complete physical examination by your regular doctor. This exam helps ensure that you are in the best possible condition to undergo the operation.

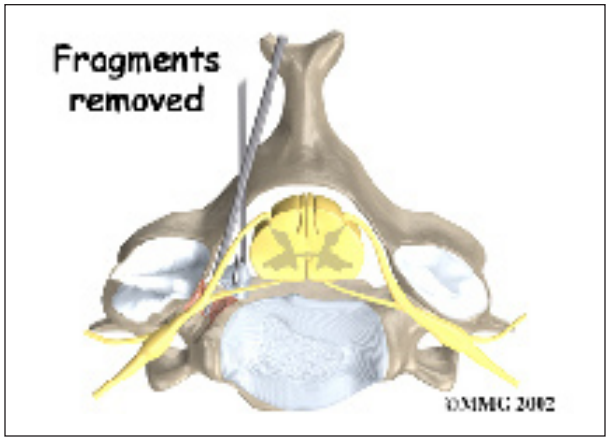
On the day of your surgery, you will probably be admitted to the hospital early in the morning. You shouldn't eat or drink anything after midnight the night before.

Surgical Procedure

What happens during the operation?

Patients are given a general anesthesia to put them to sleep during most spine surgeries. For shorter procedures such as foraminotomy, patients are usually given a gas form of anesthesia through a mask. As you sleep, your breathing may be assisted with a *ventilator*. A ventilator is a device that controls and monitors the flow of air to the lungs.

This surgery is usually done with the patient lying face down on the operating table. The surgeon makes an incision down the middle of the back of the neck. The skin and soft tissues are separated on the side where the spinal nerves are compressed. Some surgeons use a surgical microscope during the procedure to magnify the area they'll be working on.



The surgeon may use a small, rotary cutting tool (a *burr*) to shave the inside edge of the facet joint. This opens up the outer rim of the neural foramen. The burr is sometimes used to shave a small section of the bony ring on the back of the vertebra above and below the affected nerve root.

Small cutting instruments are used to carefully remove soft tissues within the neural foramen. The surgeon takes out any small disc fragments that are present and scrapes off nearby bone spurs. In this way, tension and pressure are taken off the nerve root.

The muscles and soft tissues are put back in place, and the skin is stitched together. Patients are sometimes placed in a soft collar after surgery to keep the neck positioned comfortably.

Complications

What might go wrong?

As with all major surgical procedures, complications can occur. Some of the most common complications following discectomy include

- problems with anesthesia
- thrombophlebitis
- infection
- nerve damage
- ongoing pain

This is not intended to be a complete list of the possible complications, but these are the most common.

Problems with Anesthesia

Problems can arise when the anesthesia given during surgery causes a reaction with other drugs. Patients can also have problems with the anesthesia itself. In addition, anesthesia can affect lung function because the lungs don't expand as well while a person is under anesthesia. Be sure to discuss the risks and your concerns with your anesthesiologist.

Thrombophlebitis (Blood Clots)

Thrombophlebitis, sometimes called *deep venous thrombosis* (DVT), can occur after any operation. It occurs when the blood in the large veins of the leg forms blood clots. This may cause the leg to swell and become warm to the touch and painful. If the blood clots in the veins break apart, they can travel to the lung, where they lodge in the capillaries and cut off the blood supply to a portion of the lung. This is called a *pulmonary embolism*. (*Pulmonary* means lung, and *embolism* refers to a fragment of something traveling through the vascular system.) Most surgeons take preventing DVT very seriously. There are many ways to reduce the risk of DVT, but probably the most effective is getting you moving as soon as possible. Two other commonly used preventative measures include

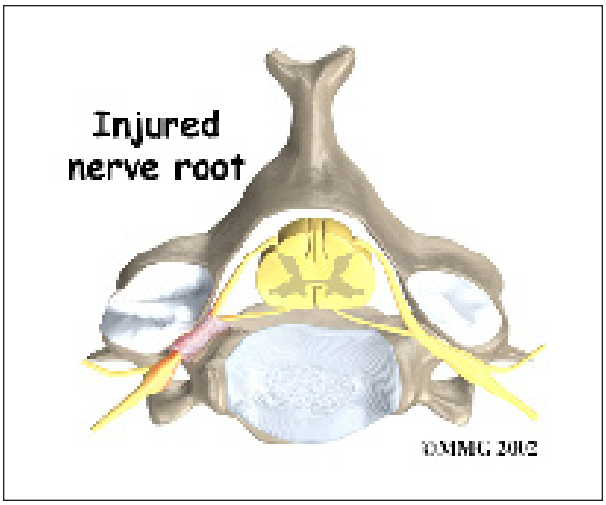
- pressure stockings to keep the blood in the legs moving
- medications that thin the blood and prevent blood clots from forming

Infection

Infection following spine surgery is rare but can be a very serious complication. Some infections may show up early, even before you leave the hospital. Infections on the skin's surface usually go away with antibiotics. Deeper infections that spread into the bones and soft tissues of the spine are harder to treat and may require additional surgery to treat the infected portion of the spine.

Nerve Damage

Any surgery that is done near the spinal canal can potentially cause **injury** to the spinal cord or spinal nerves. Injury can occur from bumping or cutting the nerve tissue with a surgical instrument, from swelling around the nerve, or from the formation of scar tissue. An injury to these structures can cause muscle weakness and a loss of sensation to the areas supplied by the nerve.



Ongoing Pain

Many patients get nearly complete pain relief from the foraminotomy procedure. As with any surgery, however, you should expect some pain afterward. If the pain continues or becomes unbearable, talk to your surgeon about treatments that can help control your pain.

After Surgery

What happens after surgery?

Patients are usually able to get out of bed within an hour or two after surgery. Your surgeon may have you wear a soft neck collar. If not, you will be instructed to move your neck only carefully and comfortably.

Most patients leave the hospital the day after surgery and are safe to drive within a week or two. People generally get back to light work by four weeks and can do heavier work and sports within two to three months.

Outpatient physical therapy is usually prescribed when patients have extra pain or show significant muscle weakness and deconditioning.

Rehabilitation

What should I expect during my recovery?

Rehabilitation after foraminotomy surgery is generally needed for only a short period of time. If you require outpatient physical therapy, you will probably need to attend therapy sessions for two to four weeks. You should expect full recovery to take up to two or three months.

Many surgeons prescribe outpatient physical therapy within four weeks after surgery. At first, treatments are used to help control pain and inflammation. Ice and electrical stimulation treatments are commonly used to help with these goals. Your therapist may also use massage and other hands-on treatments to ease muscle spasm and pain.

Active treatments are added slowly. These include exercises for improving heart and lung function. Walking, stationary cycling, and arm cycling are ideal cardiovascular exercises. Therapists also teach specific exercises to help tone and control the muscles that stabilize the neck and upper back.

Your therapist works with you on how to move and do activities. This form of treatment, called *body mechanics*, is used to help you develop new movement habits. This training helps you keep your neck in safe positions as you go about your work and daily activities. At first, this may be as simple as helping you

learn how to move safely and easily in and out of bed, how to get dressed and undressed, and how to do some of your routine activities.

Then you'll learn how to keep your neck safe while you lift and carry items and as you begin to do heavier activities.

As your condition improves, your therapist will begin tailoring your program to help prepare you to go back to work. Some patients are not able to go back to a previous job that requires heavy and strenuous tasks. Therapists may suggest changes in job tasks that enable you to go back to your previous job. They may also provide ideas for alternate forms of work. You'll learn to do your tasks in ways that keep your neck safe and free of extra strain.

Before your therapy sessions end, your therapist will teach you a number of ways to avoid future problems.

Notes