

A Patient's Guide to **Cervical Corpectomy and Strut Graft**



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This education section was created to help my patients and referring physicians learn more about common orthopedic and sports injuries.

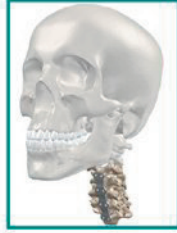
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Cervical Corpectomy and Strut Graft



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Introduction

A *corpectomy* is surgery to relieve pressure on the spinal cord due to *spinal stenosis*. In **spinal stenosis**, bone spurs press against the spinal cord, leading to a condition called *myelopathy*. This can produce problems with the bowels and bladder and disrupt the way you walk. Fine motor skills of the hand may also be impaired. In a corpectomy, the front part of the spinal column is removed. (*Corpus* means body, and *ectomy* means remove.) Bone grafts are used to fill in the space. This procedure is used when bone spurs have developed in more than one vertebra.

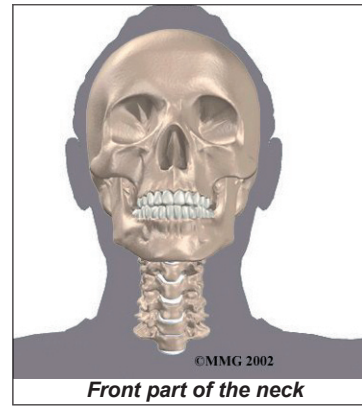
This guide will help you understand

- what part of the spinal column is affected
- why the procedure becomes necessary
- what happens before and during the operation
- what to expect as you recover

Anatomy

What parts of the neck are involved?

Surgeons perform this surgery through the **front of the neck**. This is known as the *anterior* neck region. Key structures include



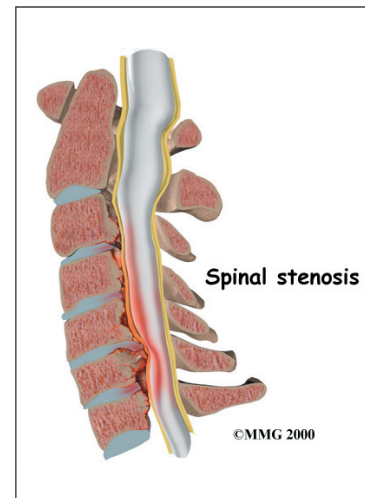
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 Front part of the neck

ligaments, bones, intervertebral discs, the spinal cord opening and spinal nerves.

Rationale

What do surgeons hope to achieve?

Spinal stenosis occurs when bone spurs project into the spinal column and press against the spinal cord. Removing the vertebral bodies along the front section of the spinal column gives surgeons a way to relieve pressure on the front surface of the spinal cord, reducing or eliminating the symptoms caused by the bone spurs.



Spinal stenosis

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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. 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.

The surgeon starts by making an incision up the left side of the neck to the ear and then under the jaw to the bottom of the chin. The skin flap is opened to expose the structures of the neck. Retractors are used to separate and hold the muscles and soft tissues apart so the surgeon can work on the front of the spine.

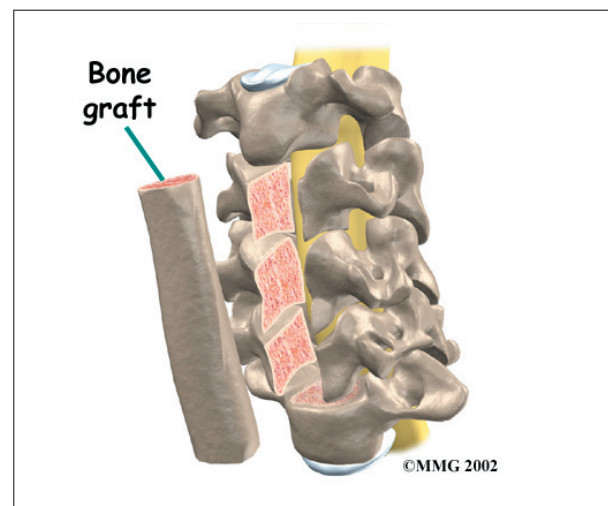
Special instruments are attached either to the skull or the spinal bones to stretch the neck with mild traction. The traction pull spreads the neck joints apart to give the surgeon more room to work. It also takes additional pressure off the spinal cord. Then the surgeon inserts a needle into the disc and does an X-ray to locate the exact sections where the bones are to be removed.

The surgeon carefully cuts part of the *anterior longitudinal ligament* away from the front section of the spinal column. Instruments are then used to take out the front half of the discs that lie between the vertebral bodies. Next, a small rotary cutting tool (a *burr*) is used to carefully remove the back half of the discs (called *discectomy*) and a row of vertebral bodies (called *corpectomy*). The ring of bone that surrounds and protects the spinal column isn't touched.

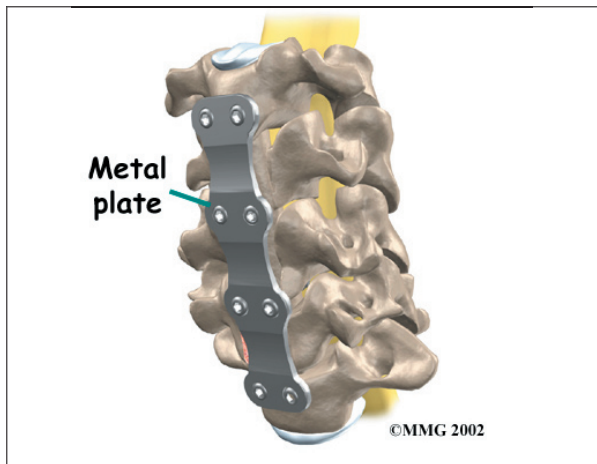
When the discs and vertebral bodies are out of the way, the *posterior longitudinal ligament* can be seen where it covers the front of the spinal cord. This thin ligament is shaved to remove areas that have hardened or buckled, as these areas are known to add pressure to the spinal cord.

The surgeon then prepares a *bone graft* that will fill in the space where the discs and vertebral bodies have been removed. A section of bone is taken from the *fibula*, the thin bone that runs along the outside of the lower leg. (The main bone of the lower leg is called the *tibia*.) Some surgeons prefer to take bone from the pelvis instead of the fibula.

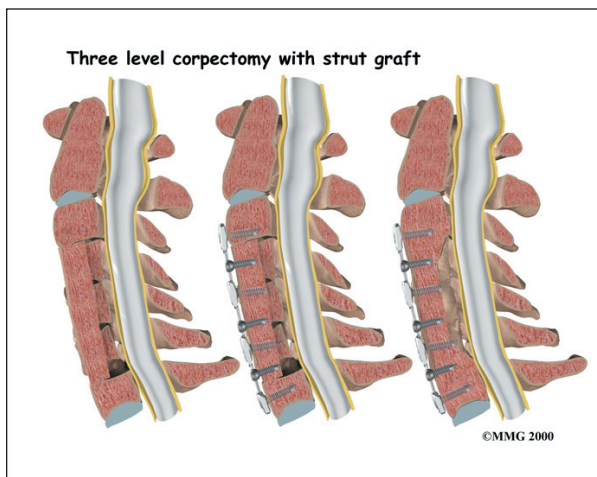
Before inserting the **bone graft**, the surgeon increases the traction pull on the neck to help separate the space even more. The bone graft is sized to fill the full length of the removed section of bone and discs from one end to the other.



The section of bone is grafted into the space where the vertebral bones have been taken out. The graft acts like a supportive column, or *strut*, to support the elongated space and to prevent the neck from buckling forward. Your surgeon may attach a **metal plate** along the front of the spine to help lock the new graft in place.



Another X-ray is taken to check the position of the graft. Then the muscles and soft tissues are put back in place, and the skin is stitched together. Patients are often placed in a rigid neck brace for at least three months to hold the neck still while the bones grow together, or *fuse*.



Complications

What might go wrong?

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

- problems with anesthesia
- thrombophlebitis
- infection
- nerve damage

- problems with the graft or hardware
- nonunion
- 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

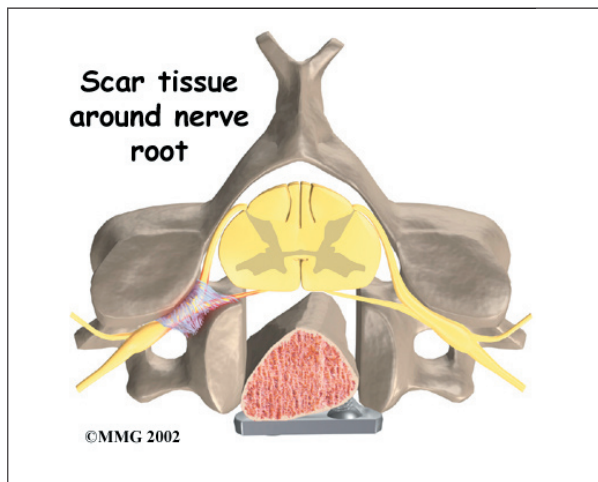
Infection following spine surgery is rare but can be a very serious complication. Some infections may show up very early, even before you leave the hospital. Infections on the

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. Your surgeon may give you antibiotics before spine surgery when the procedure requires bone grafts or hardware (plates, rods, or screws).

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.

The nerve to the voice box is sometimes injured during surgery on the front of the neck. Surgeons usually prefer to do surgery on the left side of the neck where the path of the nerve is more predictable than on the right side. During surgery, the nerve may be stretched too far when retractors are used to hold the muscles and soft tissues apart. When this happens, patients may be hoarse for a few days or weeks after surgery. In rare cases in which the nerve is actually cut, patients may end up with ongoing minor problems of hoarseness, voice fatigue, or difficulty making high tones.



Problems with the Graft or Hardware

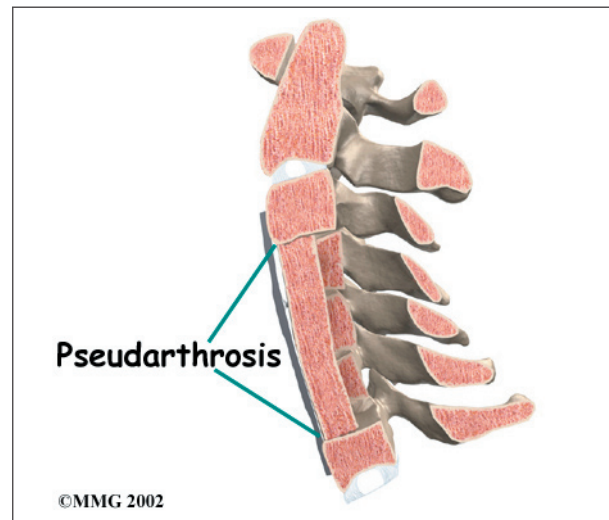
Corpectomy surgery requires bone to be grafted into the spinal column. The graft is taken from either the top rim of the pelvis or, more commonly, from the fibula bone along the outside of the lower leg. There is a risk of having pain, infection, or weakness in the area where the graft is taken.

After the graft is placed, the surgeon checks the position of the graft before completing the surgery. However, the graft may shift slightly soon after surgery to the point it is no longer able to hold the spine stable. When the graft migrates out of position, it may cause injury to the nearby tissues. When the graft shifts out of place, a second surgery may be needed to align the graft and apply more hardware to hold it firmly in place.

Hardware can also cause problems. Screws or pins may loosen and irritate the nearby soft tissues. Also, the metal plates can sometimes break. The surgeon may suggest another surgery either to take out the hardware or to add more hardware to solve the problem.

Nonunion

Sometimes the bones do not fuse as planned. This is called a *nonunion*, or *pseudarthrosis*. (The term *pseudarthrosis* means false joint.) If the joint motion from a nonunion continues to cause pain, you may need a second operation.



In the second procedure, the surgeon usually adds more bone graft. If hardware was used in the first surgery, the surgeon will check to make sure it is attached firmly. Hardware may also be added to secure the bones so they will fuse together.

Ongoing Pain

Corpectomy is a complex surgery. Not all patients feel complete pain relief with this procedure. The main goal of this surgery is to get pressure off the spinal cord and to try and prevent further problems. As with any surgery, 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?

Most patients are placed in a rigid neck brace or a *halo vest*, for a minimum of three months after surgery. These restrictive measures may not be needed if the surgeon attached metal hardware to the spine during the surgery.

Patients usually stay in the hospital after surgery for up to one week. During this time, a physical therapist will schedule daily sessions to help patients learn safe ways to move, dress, and do activities without putting extra strain on the neck.

Patients are able to return home when their medical condition is stable. However, they are usually required to keep their activities to a minimum in order to give the graft time to heal. Outpatient physical therapy is usually started five weeks after the date of surgery.

Rehabilitation

What should I expect during my recovery?

Rehabilitation after corpectomy surgery can be a slow process. You will probably need to attend therapy sessions for two to three months, and you should expect full recovery to take up to one year.

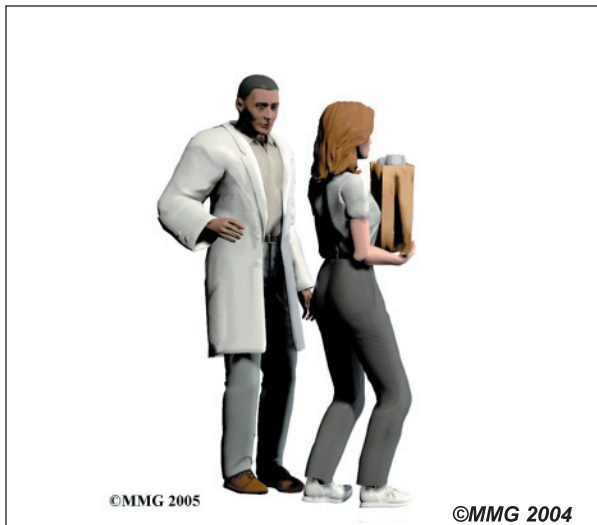
Many surgeons prescribe outpatient physical therapy beginning a minimum of five weeks after surgery. At first, treatments are used to help control pain and inflammation. Ice and electrical stimulation treatments are commonly used to help with these goals. Your therapist may also use massage and other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



Active treatments are slowly added. 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 also 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 other heavier activities.

As your condition improves, your therapist will tailor 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. Your therapist may suggest changes in job tasks that enable you to go back to your previous job. You'll learn new ways to do these tasks to 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