

## Cervical Disc Herniation

The disc (or intervertebral disc) is a structure that is found in between the spinal vertebral bodies from the neck to the sacrum (tailbone). The disc serves as a cushion and helps the spine to move. A single disc and its two vertebral bodies does not have much ability to move, however, when put together along the length of the spine, the amount of movement provided is considerable.

Each disc is composed of two parts, the nucleus pulposus (the central part) and the annulus fibrosus (the outer part). The nucleus pulposus provides the padding and it is contained by the annulus fibrosus which forms a ring around the nucleus pulposus and also attaches to the vertebral bodies above and below.

A number of problems with the discs in the neck (cervical discs) can cause symptoms in patients. The two most commonly seen problems are disc herniations (abnormal protrusions of a portion of the disc material) and disc degeneration (changes in the disc seen in normal aging and also in injury).

There are seven vertebral bodies in the cervical spine. The first two are fairly specialized. The rest are quite similar to one another.

The most common levels for disc problems are in descending order:

- C6-C7 (C refers to cervical and the number refers to the number of the vertebral body counting from the top).
- C5-C6, C7-T1 (here the T refers to the thoracic spine, the part that the ribs attach to),
- C4-C5 and very rarely C3-C4. Pressure on a nerve root is referred to as cervical radiculopathy.

Cervical disc herniations can press on the spinal cord and cause a problem called cervical myelopathy. This group of symptoms differs from the symptoms caused by pressure on the nerve roots. In general, cervical myelopathy is a more urgent problem than cervical radiculopathy. Radiologists and surgeons use a number of different terms when they refer to disc problems. Herniated disc, ruptured disc, protruded disc, prolapsed disc and slipped disc generally all mean the same thing.

These terms imply that the nucleus pulposus has been displaced backwards and is pressing on a nerve root (or roots). Disc bulge refers to a general enlargement of the disc beyond its normal boundary. A disc bulge is not necessarily an abnormal finding and may simply be the result of aging.



Similarly, the term disc degeneration (or degenerated disc) is often used, particularly in MRI reports. This means that there has been a loss of the fluid content of the disc and usually a loss of the normal disc height. Again, this is seen in normal aging. Although disc bulges and disc degeneration are seen in normal aging, they can both be associated with clinical problems.

### Causes

The most common symptom of a cervical disc herniation is neck pain that radiates (spreads) down to the arm in various locations. The specific location of the arm pain depends on which disc is involved.

There can also be associated paresthesias (pins and needles) and in some cases weakness of some of the arm muscles. Patients find that turning their head away from the painful side helps. Extending the head makes the pain worse so that looking up is avoided. Bending the head down usually gives some relief.

Most of the symptoms of a disc herniation are related to pressure on a specific nerve root. Rarely, large disc herniations can cause pressure on the spinal cord. Pressure on the spinal cord can result in a problem called cervical myelopathy. It can cause among other things spasticity which can present as problems walking.

### Symptoms

Level	C4-C5	C5-C6	C6-C7	C7-T1
Weakness	Shoulder	Forearm flexion	Wrist extension	Grip
Numbness	Shoulder	Upper arm, thumb	Middle finger, all fingertips	Ring and little fingers

**These symptoms can be present in varying degrees and may not be present in all patients.**

If symptoms do not improve with conservative (non-surgical) treatment or are very severe, an imaging study may be ordered. An MRI of the cervical spine is a very sensitive test for cervical disc herniation. In some cases it may be necessary to continue with a cervical myelogram and post-myelogram CT scan. Some patients may also undergo electromyography and nerve conduction velocity testing (EMG/NCV).

### Diagnosis

As always, a careful history and physical examination are the first steps in diagnosis. The symptoms of a cervical disc herniation are always on the same side as the disc herniation. In other words a right sided disc herniation between the fifth and sixth cervical vertebrae will always cause pressure on the right sixth cervical nerve root.



## Treatment

The treatment of cervical disc herniation can be divided into two categories, conservative (non-surgical) and surgical. In some rare cases of very large disc herniation causing significant pressure on the spinal cord, surgery may be considered the conservative option.

In general, conservative management consists of maneuvers to reduce pressure on the nerve root. Immobilization with the neck in a flexed forward position may be helpful. Straining should be avoided. Medication in the form of an anti-inflammatory such as aspirin, ibuprofen, naproxen, celebrex or viox may be taken. As these medications have side effects, patients should carefully read the package material or consult their doctor if taking any medications for longer than a few days. Physical therapy may be prescribed. This can consist of traction, mild stretching, exercise, heat, massage and ultrasound. These can be used in various combinations depending on the patient.

A course of home cervical traction may be helpful. In some cases, a referral may be made to a pain management specialist or a physiatrist. These are doctors with special training in the diagnosis and treatment of pain. Various injections in and around the cervical spine can be performed. The particular type of injection depends on the individual patient. Up to 95 percent of patients will get better without the need for surgery.

Surgical treatment is reserved for patients who exhibit the signs and symptoms that require urgent decompression, patients who can not or do not wish to spend the time to allow conservative approaches to work and patients who have failed conservative management after a reasonable amount of time (six to eight weeks).

Surgery for cervical disc herniation is divided into two approaches, anterior (from the front) and posterior (from the back). Since the disc is located in front of the spinal cord, the anterior approach is the more direct approach. The most common anterior operation is the anterior discectomy and fusion (ACDF). The disc is removed and usually replaced with a small piece of bone (either from the patient's hip or from cadaver donor). Sometimes, metal plates and screws may be used to assist the fusion.

Depending on the type of surgery performed, a cervical collar may need to be worn for anywhere from a week to twelve weeks. The posterior approach is much less commonly performed. In this operation, a small amount of bone is removed from the back of the spine over the affected nerve root. Gentle retraction may allow removal of a soft disc. Few surgeons perform this operation.

