

Cervical Disc Herniation Introduction

The seven cervical (neck) vertebrae support the head, allowing rotation and movement and providing pathways for the spinal cord and the cervical nerves. Besides the vertebral foramen (the spinal canal through which the spinal cord passes), the cervical vertebra have smaller foramina (canals) through which a large artery and the cervical nerves pass.

The cervical nerves are responsible for controlling the neck, arms and upper body. The portion of the cervical nerve as it exits the spinal column is called the nerve root. The functions of the cervical vertebrae— spinal cord and artery pathways, support, and movement – make them especially significant for spinal health.

What is a cervical disc herniation?

The discs between the cervical vertebrae are much smaller than the other discs in the back. They can become weakened, causing some of the disc material to protrude. This generally occurs at the lower level of the neck, at the fifth or sixth vertebra (C-5 or C-6 or C-7). In a cervical disc herniation, the herniated disc generally pushes outward rather than inward on the spinal nerve. This outward protrusion places pressure on the cervical nerve roots, resulting in dysfunction and pain in the neck, arms, and upper body.

What causes cervical disc herniation?

Accidents, especially those with an abrupt change in speed, are one cause of cervical disc herniation. The weight of the head, when whipped rapidly or violently, exerts tremendous force on the neck muscles and structures. This force can weaken the wall (annulus fibrosus) of the disc, causing the disc material to bulge outward. Disc degeneration related to repetitive minor trauma can also lead to disc herniation.

Because the discs between the cervical vertebrae are much smaller and generally bear a lesser load than discs in the lumbar region, herniations occur less often than in other areas of the spine. Posture or position problems, when chronic, may also weaken the muscles and structures of the spinal column.

Can cervical disc herniation be prevented?

The best way to prevent cervical disc herniation is to prevent accidents and reduce the severity of injuries. Seat belts and air bags in cars are designed especially for this purpose. Ergonomic working positions and appropriate exercise and rest all help to prevent injuries and achieve good neck health.

□ What treatment options are there for cervical disc herniation?

If conservative treatment fails to relieve the pain after 2 or 3 months, surgery may be necessary to relieve the pressure on the cervical nerves. After using an MRI or CT scan to determine the exact presence of the herniation, the herniated disc may be surgically removed either from the front (anterior) or the back (posterior) of the neck. Surgery may also be urgently recommended for progressive weakness, numbness or severe neck and arm pain.

Most cervical herniated discs are removed from the front as this procedure allows the surgeon to more easily place bone graft in the disc space. This results in a wider opening for the nerve root. The posterior route may be more appropriate if the disc is large and soft and protrudes to the side of the canal. In either case, most patients are able to return home after one night in the hospital.

The use of advanced microscopic imaging, computers, software and tracking technology allow the surgeon to clearly visualize structures, make decisions based upon precise measurements and information, and maneuver in exacting detail. Dr. Scott Leary has a number of new approaches that reduce patient recovery time and improve outcomes, and offering the newest treatment in spine surgery.

□ Types of Surgery

1. Microscopic posterior cervical foraminotomy

The foramen, the small canal within or between the vertebra, provides the passageway for a nerve. If the disc has ruptured or the body of a vertebra has collapsed, the foramen is distorted or made smaller, pressing on the nerve. Using advanced microscopic imaging, computers, software and tracking technology the surgeon is able to clearly see and maneuver at the same time within a very limited area, reducing injury to surrounding tissues. Tiny portions of the bone surrounding the foramen are removed, leaving a larger canal for the nerve to occupy without pressure. The new technologies available at Dr. Leary's private practice help the surgeon avoid injury to the nerve during the procedure.

2. Anterior cervical discectomy and fusion

Removal of a cervical herniated disc (cervical discectomy) is necessary when the disc has ruptured and lost its ability to retain its form, thereby placing pressure on the nerves. From an incision on the front of the neck, the disc is carefully and precisely removed and the two bordering vertebrae are joined to create stability. Very small sections of bone may be used from another part of the body to bridge the gap left from the removed herniated disc (fusion).

3. Cervical Laminoplasty

The lamina is a flat portion of bone that is the back portion of the vertebra. When the spinal canal has become too small due to injury or disease, it may be made larger by use of laminoplasty. An incision is made down the back of the neck to expose the cervical vertebrae. On one side of the vertebral column, the lamina are cut through just far enough to create a hinge-like movement, much like a door. Then the lamina on the other side are cut all the way through to, in effect, open the door. The back portion of the vertebrae, the spinous processes (bumps you feel on the back) are removed to make more room for the "door" to open. After gently opening the "door" of each vertebra to create more room for the spinal cord and nerve roots behind it, bone wedges are inserted to keep the "door" from totally closing. Then the "door" is closed securely onto the wedges, resulting in an expanded "doorway" for the nerves.

By increasing the space for the spinal cord and nerve roots, laminoplasty reduces the cause of pain and may help prevent progression of spinal deformity. It preserves the stability of the neck, but may result in loss of the ability to extend the neck backwards and may reduce other cervical motion. A relapse of pain may occur if excessive bone growth occurs as the bone heals.

4. Cervical instrumentation

Advanced imaging equipment also provides the surgeon with the ability to precisely determine what the final position of the vertebrae, and subsequently the nerve canals, should be. Thorough and accurate measurements of positions of the vertebral structures assure the surgeon that both bone and manufactured implants precisely align the spine and the nerve canals. The correct sizing of the implant, using interactive templating, is critical in obtaining an ideal outcome. This precision available at Dr. Leary's private practice is possible using microscopic imaging, computers, software and tracking technology.