How is a herniated cervical intervertebral disc treated?

Conservative treatment is generally sufficient for mild symptoms not complicated by neurological dysfunctions.
· Medication with non-steroid antiphlogistics, painkillers, muscle relaxants
· Physiotherapeutic exercises, isometric exercises and massages

Surgery is an option if the pain persists despite suitable conservative treatment and if the neurological symptoms worsen; it is urgently indicated in case of acute compression of the myelon with neurological deficits. There are a number of surgical methods available for treatment of degenerative diseases of the intervertebral discs of the cervical spine which can be done from the back (dorsal) or from the front (ventral). The objective of all methods is to eliminate the pressure on the neural structures caused by the prolapsed intervertebral disc components (decompression).

Depending on the specific findings in each case, the following surgical options may be used:
· Ventral microsurgical nucleotomy with Cloward-Robinson fusion
· Ventral uncoforaminotomy with Cloward-Robinson fusion
· Ventral decompensation with implantation of a cervical intervertebral disc prosthesis

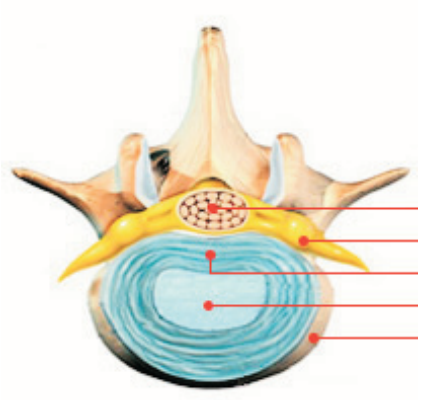
What is lumbar intervertebral disc disease?

Changes in the intervertebral disc structure due to wear (degeneration) in the lumbar spine can lead to intervertebral disc protrusion or a herniated intervertebral disc.
When elements of an intervertebral disc shift toward the spinal cord or spinal nerve, pressure is exerted upon these structures, causing pain that radiates into the leg as well as sensorimotor dysfunctions.

How does a herniated lumbar disc occur?

During the natural aging process, the intervertebral disc loses elasticity due to metabolic imbalances. It grows hard, begins to show cracks in the outer fibrous ring (annulus fibrosus), and the gelatinous core (nucleus pulposus) loses the capacity to take up sufficient water to maintain its elasticity. The disc grows thinner, which disturbs the structural balance within the mobile segment. The forces acting upon the lumbar spine can no longer be adequately absorbed, dampened and distributed, exacerbating the process of structural change.
The altered pressure loads induce spondylotic outgrowths on the vertebrae (spondylosis) and the form of the vertebral joints is altered (spondylarthrosis). The stabilizing ligamentous apparatus is overstretched, resulting in mobile segment instability.
Changes in pressure load can also cause parts of the intervertebral discs to shift position toward the spinal cord and spinal nerves. Bulging of the intervertebral disc, where the annulus fibrosus is intact is known as intervertebral disc protrusion. A shift in the location of the nucleus pulposus with a torn annulus fibrosus is called a herniated disc. If the extruded disc material separates from the disc and becomes freely mobile within the spinal cord or spinal nerve canal, this is called a sequestered disc.
A herniated intervertebral disc can be designated according to its position as medial (central), with pressure on the spinal cord, or lateral (to the side), with pressure on the spinal nerve roots, causing symptoms accordingly. A prolapse in both directions is called mediolateral.
Multisegmental intervertebral disc disease involving the instability of several mobile segments may in time develop into a degenerative lumbar scoliosis.

• View of lumbar vertebra with normal location of the intervertebral disc in relation to spinal cord and spinal nerves. Annulus fibrosus and nucleus pulposus intact.



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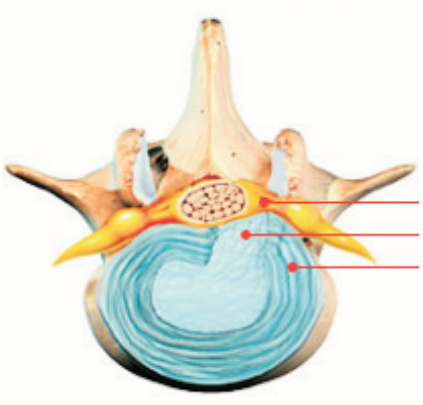
• Protrusion of nucleus pulposus, annulus fibrosus still intact

· Intervertebral disc protrusion

• Herniated intervertebral disc with torn annulus fibrosus, extrusion of nucleus pulposus with compression of the spinal cord and spinal nerves

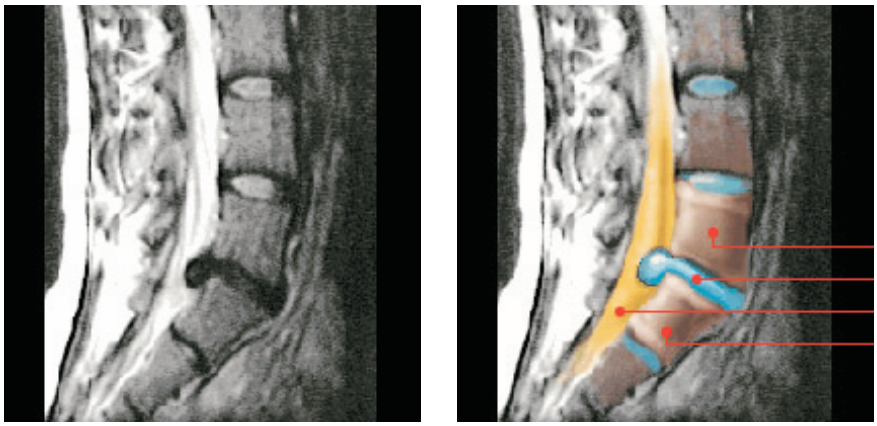


· Compression
· Prolapsed nucleus pulposus
· Torn annulus fibrosus

How is a herniated intervertebral disc diagnosed?

An exhaustive case history combined with physical and neurological examinations provide the basis for a tentative diagnosis of a potential intervertebral disc problem.
X-rays of the lumbar spine can reveal vertebral degeneration; the reduced height of the intervertebral spaces shown on the images serves as an indication of intervertebral disc damage.
Nuclear resonance and computer tomography, and contrast myelography of the spinal column can then provide direct confirmation of a herniated disc.

• Nuclear magnetic resonance tomography of the lumbar spine, side view, with herniated intervertebral disc (L5/S1) and compression of the spinal cord



Neurophysiological examinations (electromyography (EMG), electroneurography (ENG) and somatosensory evoked potential (SEP)) can confirm whether the existing pressure has already damaged the spinal nerves.

What are the symptoms of a herniated lumbar intervertebral disc?

General symptoms such as myogelosis in the muscles of the lumbar area, pressure and percussion tenderness of the lumbar spine, restriction of mobility and pain when seated are generally present. The fingertip-to-floor distance may be reduced, and the mobility of the lumbar and thoracic spine restricted (Schober's sign, Ott's sign).
The Valleix trigger points along the sciatic nerve are tender if the corresponding nerve root is irritated. Coughing, pressing, or sneezing may significantly worsen the radiating pains.
Depending on the segment in which the intervertebral disc herniation has occurred, symptoms observed correspond to the area supplied by the spinal nerve branch affected.
Herniated discs in segments L3 and L4 produce pain and dysesthesias on the front and inner surfaces of the thigh and the inner side of the calf, the Lasègue's sign is negative and pain can generally be induced by raising the stretched leg from a prone position (femoralis extension pain). The patellar (knee jerk) reflex is weakened.
A herniated disc in the L5 segment causes pain to radiate from the rear outer side of the thigh to the front outer side of the calf. The Lasègue's sign is positive.
In cases of root compression in the S1 segment, pain and sensory dysfunctions are experienced in the calf, heel, the outer edge of the foot and the 3rd to 5th toes. Lasègue's sign is positive and the Achilles reflex (ankle jerk reflex) is weakened.
A medial massive herniation, usually at L3/L4 or L4/5, can result in massive pressure on the spinal cord, causing cauda syndrome. Such herniations are accompanied by bladder and colon dysfunction and saddle-block numbness with dysesthesias along the inner sides of the thighs.

• Distribution of pain and dysesthesias resulting from irritation of the lumbar spinal nerve roots

Are there any other diseases that cause similar symptoms (differential diagnosis)?

Diseases of the spinal column such as spinal canal stenosis, tumors and metastases, spondylolisthesis, and spondylodiscitis can cause similar symptoms.
Arterial occlusion disease of the pelvic and femoral arteries, hip arthrosis, gynecological processes and sacroiliac processes may also involve similar symptoms.

How is a herniated lumbar intervertebral disc treated?

Conservative treatment consists of medication with analgesics, muscle relaxants and antiphlogistics. Nerve root block, epidural infiltration and CT-controlled injection treatments can also be done. Positioning the supine patient with his or her legs supported on a cubical cushion helps relieve pain in the acute phase. After the severe symptoms have passed, rehabilitation can begin with physiotherapy, massages, the application of heat, and electrotherapy. Antilordotic bandages or an orthosis can be used to provide additional relief.
In the presence of cauda syndrome or rapidly worsening neurological dysfunctions, surgical decompression of the spinal cord or nerve root is urgent (absolute surgical indication). Surgery may also be indicated if strong pains and dysfunctions persist despite intensive conservative treatment.
Selecting a surgical approach depends on whether the findings are monosegmental or multisegmental and on how pronounced any instability is.
Depending on the initial findings, the following approaches are available for the surgical treatment of herniated lumbar intervertebral discs:

· Intradiscal electrothermal therapy (IDET)
· Microsurgical nucleotomy
· Monosegmental/bisegmental decompression and fusion using the TLIF (transforaminal lumbar interbody fusion) method
· Monosegmental/bisegmental decompression and fusion using the ALIF (anterior lumbar interbody fusion) method
· Decompression with implantation of a lumbar intervertebral disc prosthesis