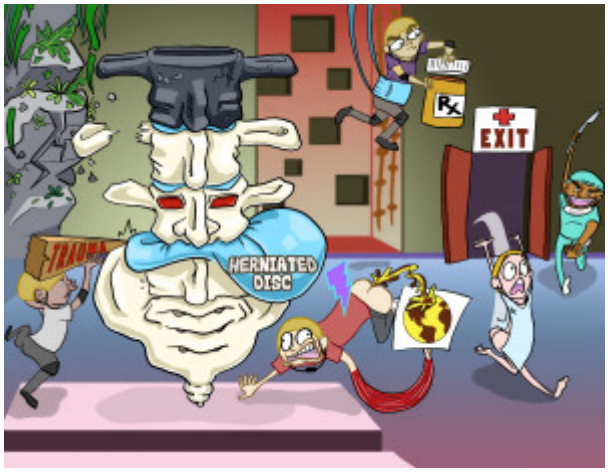
Herniated Disc (Nucleus Pulposus)

Herniated disk, also referred to as herniated nucleus pulposus (HNP), is a structural deterioration of the intervertebral discs that provide shock absorption for the spine. Also known as "slipped disc," damage to the disc enables the nucleus pulposus to seep through the torn or stretched annulus and bulge outward between the vertebrae. HNP frequently occurs between L5-S1 or the fourth and fifth lumbar vertebrae. Causes of HNP include natural degeneration, spine trauma, and spinal stenosis. Assessment findings include radiating pain, lower extremity weakness, and bowel/bladder incontinence. Diagnostic studies to determine structural defects and locate damaged sites include x-rays, myelogram, MRI, and CT scan. Interventions for HNP include wearing a brace to support the spine. Medications include NSAIDs, opioids, analgesics, epidural corticosteroids, muscle relaxants, and antidepressants. Invasive procedures indicated for patients with HNP include intradiscal electrothermal plasty (IDET), interspinous process decompression, laminectomy, discectomy, spinal fusion, and artificial disc replacement.



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Cause/Mechanism

Spine Trauma
Spine Trauma-spike
Acute trauma to the spine may tear or overstretch the annulus of the disc and cause a herniated nucleus pulposus. Disc herniation may also be caused by repeated stress to the spine as the annulus wears out.

Natural Degeneration
Nature Degenerating
Age-related changes include natural degeneration of the spinal column. Natural degeneration weakens the firm outer layer of the disc and allows the jelly-like nucleus pulposus to leak through the disc.

Spinal Stenosis
Spine of stone
Spinal stenosis causes disc herniation as the narrowing of the spinal canal displaces the nucleus pulposus and forces the intervertebral disc to bulge outwards.

Assessment

Pain
Pain-bolt
Disc herniation places pressure on nearby spinal nerves and often cause pain in the lower back. Herniated discs cause radiculopathy as the pressed nerves radiate pain, numbness, and tingling down the sciatic nerve. Pain may be felt from the gluteus to below the knees. Pressure against the spinal nerves may also cause decreased strength and motion in the lower extremities.

Weakness
Drooping
Herniated discs press against the spinal nerves and cause radiculopathies in the lower extremities, characterized by radiating pain, numbness, tingling, and diminished strength or range of motion. Paresthesia, or muscle weakness, frequently occurs in the legs, feet, and toes.

Urinary and Fecal Incontinence
Urine and Feces In-continents
Herniated discs causing multiple nerve root compressions or cauda equina may affect bowel and bladder control and manifest as incontinence. This medical emergency requires immediate intervention including surgery.

Interventions

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Brace

Back Brace

Initial conservative therapy for HNP includes limitation of extremes of spinal movement. The patient may be instructed to wear a brace, corset, or belt to minimize spinal movement and maintain a straight alignment. Teaching the patient basic body mechanics is critical in preventing extreme spinal flexion and torsion. Additional conservative therapies include local heat or ice, massage, traction, and transcutaneous electrical nerve stimulation (TENS).

Medications

Med-bottle

Medications indicated to treat pain in patients with herniated discs include NSAIDs, opioids, analgesics, muscle relaxants, antiseizure drugs, and antidepressants. Epidural corticosteroids may be administered to relieve acute pain by decreasing inflammation.

Outpatient Procedures

Out-of-hospital Patient

Outpatient procedures may be performed to help relieve pain in patients with HNP. Intradiscal electrothermal plasty (IDET) is a minimally invasive procedure that requires an x-ray to guide a needle into the affected disc. A wire is threaded through the needle and heated to denervate the small nerve fibers growing in the cracks of the degenerating disc. Radiofrequency discal nucleoplasty (coblation nucleoplasty) is an outpatient procedure that involves threading a special radiofrequency probe into the affected disc. The probe breaks up molecular bonds of the nucleus pulposus and decompresses the disc and decreases pressure on the disc and nerve roots. Interspinous process decompression system (X-Stop) is indicated for patients with lumbar spinal stenosis and involves placing a titanium device on the vertebrae of the lower back to lift the vertebrae off the pinched nerve.

Surgery

Surgeon

Surgery is indicated for patients with herniated discs who fail to respond to conservative treatment, experience worsening radiculopathy, or lose bowel or bladder control. During a laminectomy, the lamina is surgically removed to access the protruding disc for removal. A discectomy may be done to decompress the nerve root by removing the offending disc. If the spine is unstable, a spinal fusion may be done using a bone graft or metal fixation including rods, plates, and screws. Artificial disc replacement is indicated to restore movement and eliminate pain.

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