

Orthopaedic Observations

A Matter of Medicine ...

TM Pending

Degenerative Disc Disease (DDD) What is degenerative disc disease?

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Degenerative disc disease (spondylosis) is a general term used to describe changes that can occur along any area of the spine (cervical, thoracic, lumbar) as you grow older, but it is most common in the lumbar area. Many medical professionals do not classify DDD as a pathology, but rather a normal part of aging. It's not actually a disease, but rather a condition

in which your discs "degenerate," or lose their flexibility and ability to cushion your spine. Your discs do not have a good blood supply, so once injured, repair is very difficult. These age-related degenerative changes include:

- Discs dry out and shrink— they are made of about 70-80% water so as you grow older they slowly lose water. This loss of flexibility puts more stress and wear on the annulus.
- Small tears occur in the annulus - sometimes some of the gel-like material, or nucleus pulposus, comes out through a tear in the wall and touches the nerves. This material contains many inflammatory proteins that can inflame the nerves and cause pain. These tears also affect the nerves in the annulus, and small movements, called micromovements, can cause discogenic pain. Over the years the proteins eventually dry up, and the discs become more stiff, in many people this can result in less pain by the time they are in their sixties.
- Disc space gets smaller - due to the loss of water in the discs the distance between vertebrae begin to collapse, which is why we get shorter as we age.
- Bone spurs (osteophytes) grow - without the discs holding apart the vertebrae, they can rub on each other causing abnormal or excessive bone growths.
- Spinal canal narrows - the factors and consequences of all the above changes causes the ligaments and facet joints to enlarge or become hypertrophic as they attempt to compensate and spread the load over

a larger area. This over-growth causes the spinal canal to narrow, which can compress the spinal cord and nerves causing pain, tingling, numbness, or weakness.

Symptoms

The most common symptom of degenerative disc disease is localized back or neck pain. When DDD causes compression of the nerve roots, the pain often radiates down the arm or leg. Tingling and/ or numbness may also be felt. In more severe cases of cervical or lumbar DDD, where there is evidence of nerve root compression, individuals may experience motor weakness. Although centralized pain is concerning, neurological compromise and symptoms that radiate away from the spine far outweigh localized back or neck pain and should be addressed immediately.

How Diagnosis is Made

- Physicians evaluate low back/neck pain by conducting a medical history, a physical exam and selected diagnostic tests. The physical exam includes an assessment of sensation, strength and reflexes in various parts of the body to help determine which nerves or parts of the spinal cord are affected.

A physician may order diagnostic studies. These tests may include:

- X-rays: will show the bones of the spine and determine if there is significant wear and tear or disease of the bone. They will also reveal whether the bones are lined up properly.
- Magnetic Resonance Imaging (MRI): uses a powerful magnetic field to produce a detailed anatomical picture of the spine and the structures within. It is probably the most useful means by which to reveal herniated discs since they are made of soft tissue that are invisible to x-rays.
- Computed Tomography (CT): also known as a CAT

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scan, uses an x-ray and a computer to generate images of the spine in slices. The CT shows the anatomy of the spine in great detail. It also clarifies the relationship of the disc or bone spurs to the spinal cord and nerves.

- **Myelogram:** an x-ray picture taken with a special dye injected into the spinal sac to highlight the spinal cord and nerves. The dye is usually injected into the spine with a needle and then the x-rays are obtained. Myelograms have largely been replaced by CT and MRI scans.
- **Discography:** an x-ray test that may help identify which discs are damaged and if they are a source of pain. It uses a contrast dye injected into the disc space to view the disc more clearly.

Treatment for Degenerative Disc Disease

Primary management for DDD is non-operative and includes nonsteroidal anti-inflammatory medications (NSAIDs) and physical therapy.

Physical therapy may include exercise programs to strengthen abdominal and spinal musculature, improve aerobic fitness, and preserve the normal inherent curvatures of the spine. The goal of physical therapy is to help you return to full activity as soon as possible. Exercise is very helpful for the pain associated with degenerative disc disease, and it may help decrease symptoms. Physical therapists can instruct you on proper lifting and walking techniques, and they will work with you to strengthen and stretch your lower back, leg, and stomach muscles. They'll also encourage you to increase the flexibility of your spine. Activity modification, rest, pain medication, muscle relaxants, and application of ice may be helpful in the acute stages. Proper posturing throughout all daily activity can help prevent further degenerative changes as well as control symptoms. Although your physical therapist may show you strengthening/stretching exercises, it's your responsibility to follow them.

Injection may be of benefit if progress has reached a plateau with conservative management. Typically cortisone will be used. Cortisone is a strong anti-inflammatory steroid medication. It is commonly injected along with a local anesthetic in order to reduce inflammation in the affected areas. Cortisone is long lasting and can be slow-releasing in order to give the best possible benefits of pain relief. An epidural or facet injection may be used. An epidural steroid injection is a common type of injection that is given to provide relief from certain types of low back and neck pain. The "epidural space" is the space between the covering of the spinal cord (dura mater) and the inside of the bony spinal canal. It runs the entire length of your spine. When injected into this area the medication moves freely up and down the spine to coat the nerve roots and the outside lining of the facet joints near the area of injection. For example, if the in-

jection is given in the lumbar spine, the medication will usually affect the entire lower portion of the spine. Facet joint injections are used to localize and treat low back pain caused by problems of the facet joints. These joints are located on each side of the vertebrae. They join the vertebrae together and allow the spine to move with flexibility. The facet joint injections form a pain block that allows the doctor to confirm that a facet joint is causing the pain. The medication used also decreases inflammation that occurs in the joint from arthritis and joint degeneration.

Surgical intervention is an option when nonoperative medical management fails to adequately relieve the intolerable pain during activities of daily living which is individual-specific. Surgery is rarely recommended unless you have a proven disc herniation or instability and your symptoms do not significantly improve with nonsurgical treatments. The goal of surgery is to stop the movement of the painful motion segment and decompress any spinal nerves. It is important to remember that while 80% of people will experience back pain during their lifetime, the pain tends to be brief and resolves with little or no medical treatment. You should understand what surgery can and can't do, and whether it can relieve your particular symptoms. Talk to your doctor about whether surgery is right for you.

- Interbody Fusion is a surgical procedure in which one or more of the bony vertebrae of the spine are permanently joined together to provide stability to the spine. Spinal fusion can be performed at any level of the spine but is most common in the lumbar and cervical regions where it is most moveable. At each level of the spine, there is a disc space in the front and paired facet joints in the back. Working together, these structures define a motion segment and permit range of motion. Two vertebral segments need to be fused to stop the motion at one segment.
- Intradiscal Electrothermal Therapy (IDET) uses a thin catheter to deliver heat directly into the spinal discs to shrink the tears and fissures in the annulus and thermo-coagulate nerves to overcome discogenic back pain.

Sources

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