

## Disc Herniations With Contralateral Extremity Pain

During my orthopedic boards in the 80's the examiner asked me to explain how a right sided lumbar disc could cause left sided leg pain. For most of my career I would have opined that contralateral leg pain was from some other pain generator than the disc. Several times a year I treat patients with a disc herniations on MRI that have radiating pain into the extremity OPPOSITE the disc lesion. I had yet another patient like that today which prompted this newsletter. I hope you find it helpful.

A Medline literature search revealed quite a few studies discussing various potential etiologies. The most common explanations are related to anatomical deficiencies resulting in reduced patency of the spinal canal or foramen with resulting stenosis. The predominant cause of this stenosis is degenerative changes. One common explanation for the stenosis is enlargement of the ligamentum flavum. This ligament is within the spinal canal and when hypertrophied (thickened) can result in both cord and root compression. These explanations still didn't help explain to me why the pain would be on the contralateral side. If the compromise was anatomically related, you would expect to see the pain on the same side of the compression.

The following explanations found in the scientific literature help to clarify the etiology of contralateral extremity radiculopathy:

**Friction or Traction Radiculitis:** In this explanation the spinal cord is essentially pinned to the back of the canal or held in a static position by the ligaments when the disc lesion presses against it. As a result, any spine movement results in excessive movement of the nerve roots on the opposite side. This results in the tensioning and irritation of the contralateral nerve root and the resulting opposite leg symptoms and findings..

**Nerve Root Adhesions:** This is an extension of the Friction Radiculitis concept. In this explanation there is an inflammatory process which occurs when there is repeated tractioning or friction of the root. Over time, and not a very long time, the swollen and irritated nerve root starts to thicken and scar down within the neural foramen and form adhesions. The adhesions prevent free and smooth root mobility and further aggravate the root causing radiculopathic findings opposite the original disc lesion.

**Chemical Radiculopathy:** This is a well know cause of radicular symptoms and is the result of chemical mediators and inflammatory cytokines which are produced in a damaged and now painful disc. The chemicals leak into the epidural space through an annular tear. Even though the disc position may not be on the side of the radiculitis, the chemicals can travel anywhere within the canal and result in contralateral or ipsilateral symptoms. These are particularly responsive to epidural steroid injections.

**Venous Congestion:** Some studies discussed patients that were operated on with discs on the "wrong" side to see what may be causing the patients pain. The surgeons observed disc herniations, as demonstrated on the MRI, on the side opposite the extremity pain. They also observed that the disc lesion resulted in the venous structures becoming congested and therefore swollen. Because the swollen veins now occupy more space in



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the area of the neural foramen, they cause compression in the nerve root. Interestingly, when the discs were removed from the opposite side, the observed the congestion immediately reduce.

All of these explanations are complicated by other conditions which frequently accompany them. The most common is prior compromise of the neural foramen and central canal due to degenerative changes which prior to the trauma had no clinical effect. Other confounding factors include congenitally small canals or canal shapes which may not be capable of accommodating even the slightest insult (e.g. trefoil central canal).

Given the multitude of reasonable explanations I am comfortable stating that the argument that contralateral leg pain is not physiologically explainable is no longer valid. There are some very good explanations that may only be proven at surgery or by using interventional techniques or powerful oral steroids. To be fair, this doesn't mean that all leg complaints have a reasonable explanation. Patients with "non-regional" or "non-dermatomal" symptoms which may cross many different regions and extremities are still likely non-physiological in origin and require further evaluation to determine if there are psychogenic, or factitious disorders that must be considered.

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