

CHIROPRACTIC NEUROLOGY RESEARCH BRIEF

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Disc Lesions: Causes & Effective Treatments

Introduction

Conditions of the intervertebral disc, such as herniation, protrusion, degeneration (diminished disc height and/or fragmentation) and primary disc (discogenic) pain, are most often associated with spinal alignment in the absence of blunt trauma. Scientific evidence suggests abnormal alignment of the spine and bad posture as predisposing causes of disc disease as seen below. This issue of CNRB will, also, discuss the efficacy of chiropractic neurology in the treatment of disc lesions.

Disc Morphology

The intervertebral disc is a common source of low back pain. Once believed to be devoid of innervation, we now know that the outer one-third of the disc contains pain-sensitive nerve endings (nociceptors) and various mechanoreceptors, including Ruffini's endings, Pacinian corpuscles, and Golgi tendon organs (1). The most common tissue responsible for generating back pain is the annulus fibrosis, the disc's most outer portion (2). Stimulation of the annulus fibrosis reproduced back pain in approximately two-thirds of subjects (3) even in the absence of positive myelogram, CT, or MRI findings. Often, the nociceptors are the source of discogenic pain and the mechanoreceptors initiate muscle spasms and which produces antalgic postures.

Mechanisms of Disc Pathology

Excessive and aberrant mechanical loading of spinal discs has been shown to lead to disc pathology. The rate of disc degeneration and low back pain increases with high mechanical loading of the spine (4). Sustained flexion or lateral flexion creates abnormal 'stress concentrations' in the annulus fibrosis and ground substance (5). Adams (6) showed that prolonged flexion of the disc could lead to fissure formation and degeneration of the annulus and discogenic pain. Whereby, Stillwell (7) showed the disc degenerating and bulging in areas of increased stress (7).

A common condition that can cause sustained abnormal disc loading is abnormal alignment of the spine (subluxation) and bad posture. Parsons and Glimcher (8) observed discs responding to stress by remodeling like bone via Wolff's Law. Abnormal spinal alignment caused changes in the chemistry of collagen fibers within the disc and a variety of abnormal loading conditions: compression, shear, pure bending, and torsion could be primary factors leading to early disc degeneration and herniation.

Bad posture creates poor 'sagittal balance' and leads to increased disc loading. Harrison (9) studied the effects of 80 millimeters of anterior thorax displacement on the loads of the lumbar discs. He found the L5 disc stress nearly doubled from a significant increase in tone of trunk-extensor muscles, mostly from the iliopsoas group. In a similar study, Kiefer (10) found that a mere 40 millimeters anterior or posterior displacement of the thoracic spine caused approximate 60 percent increase in the compressive forces on the L5 disc, most of which, also, is due to an increase in extensor muscle activity. The authors also conclude that abnormal posture may cause early degenerative changes in intervertebral discs, and thoracic lateral flexion (or list) can predispose one to unilateral disc herniation.

Manipulation Safety and Effectiveness

We chiropractic neurologists routinely perform postural examinations and, at times, solicit the help of radiographs. As seen in lateral views of the spine, normal values for the three sagittal spinal curves have been established (11-14). This is one of many reasons why normal spinal alignment has been established as a desirable clinical outcome (15).

Rotational forces from spinal manipulation cannot cause disc herniation (16), because, in the lumbar spine, the lumbar facets act as a "positive stop" to axial rotation (17) and disc injury may only occur after facet failure (fracture) (18).

Although there are few contraindications to spinal manipulation such as in the presence of a severe or progressive neurological deficit (19, 20) several studies have shown treatment of herniated discs with spinal manipulation is both safe and effective (21).

In one of the first clinical controlled trials, Nwuga (22) found spinal manipulation, which I perform less often than regular chiropractors, for disc herniation was more effective than heat, exercise and postural education. Another study of 517 patients with protruded lumbar discs found 76.8 percent had satisfactory short and long-term benefits. After treatment was completed, there were only 14.1 percent reoccurrences of pain at intervals ranging from two months to 12 years (23).

A prospective case of 27 patients sought to determine the clinical and anatomical outcome of disc herniation syndrome following chiropractic treatment. Inclusion criteria were: spinal pain and limited range-of-motion, radiculopathy, sensory and deep tendon reflex abnormalities, positive stretch-test (to differentially diagnose nerve root lesion), restricted spinal range-of-motion and MRI-documented cervical and lumbar disc herniations. Patients were treated four to five times per week for the first one to two weeks then three times per week with decreasing frequency as the patient's symptoms

improved. The duration of care varied from six weeks to six months. The study found 80 percent of patients had a good clinical outcome with visual analog scores under two (out of 10) and resolution most of abnormal clinical exam findings. Reevaluation MRIs yielded 63 percent of patients had reduced or completely resorbed herniated disc (24).

A trial compared spinal manipulation to chemonucleolysis (used as a control of known efficacy) for symptomatic lumbar disc herniation with sciatica. In the first few weeks of treatment, the manipulation group produced a statistically significant greater improvement in back pain and disability. At 12 months, the mean values for all outcomes (leg pain, back pain and self-reported disability) in the manipulation group were equivalent to chemonucleolysis (25). The authors concluded that manipulation should be considered as an option for the treatment of symptomatic lumbar disc herniation, in the absence of clear indications for surgery.

Spinal Correction

In addition to spinal manipulation, there are other chiropractic neurologic procedures that can benefit the intervertebral disc. The importance of rehabilitating the spine for disc lesions is established (26, 27). For example, “Mirror-image” manipulations and exercises (utilized extensively as I am a contributing writer for health and fitness magazines), along with spinal extension/traction methods have been used to improve the vertical alignment of the spine and restore the sagittal curves (28). Its pain relief and spinal correction has created more symmetrical disc loading (29-34).

Summary

There is a strong association between abnormal spinal alignment, subluxation and disc disease. Treating disc conditions, with no clear indication for surgery, with chiropractic neurologic care which includes manipulations, exercise and stretching can restore normal spinal functionality, is one of the most efficacious treatment methods and should be considered as a treatment option.

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