

## Low-Tech Clinical Methods to Detect Lumbar Disc Herniation

Patients presenting with lumbar spine pain and/or referred lower extremity leg pain are commonly encountered in clinical chiropractic practices. In addition to the history, a physical exam that includes range-of-motion, sensory dermatomal analysis, reflex exam, muscle testing, and orthopedic tests are the standard. Positive signs such as limited ranges-of-motion, weakness, sensory abnormalities, and tests and maneuvers such as a positive straight leg raise, Bechterew's, Milgram's, and Valasalva's, etc., are suggestive of a lumbar disc syndrome.

### Lumbar ROM and Lasegue's Sign/Lasegue's Crossed SLR

In a recent paper, Vucetec and Svensson did a prospective 123 patient study on patients with lumbar disc herniation (LDH) who went to surgery. They compared the physical exam findings to the surgical findings and found that only three tests were of statistically significant sensitivity in confirming the presence of LDH. Lumbar sagittal flexion, Lasegue's sign and Lasegue's crossed test were useful in discriminating a ruptured annulus versus an intact annulus. They found that neurologic signs were often absent, showed low correlation with the degree of herniation, and had limited value for predicting the level of herniation.<sup>1</sup> They found that the more limited the patient's restricted range-of-motion, the greater the extent of the disc herniation (see Table 1).

Table 1: Degree of disc herniation vs. mean degrees. The greater the limitation on the tests, the greater the grade of herniation.

Degree of Herniation	Mean Degrees
Normal disc	44.5
Protruded disc	43.7
Extruded disc	33.4
Sequestered disc	25.1

In addition, the greater the limitation on Lasegue's crossed test, the greater the grade of herniation (a positive Lasegue or crossed Lasegue was pain into the leg and foot).

In another paper, Jonsson et al.<sup>2</sup> compared the straight leg raise (SLR) test with pre-op and post-op surgical findings. In the pre-op group, 86% of the patients had a positive SLR test. The SLR was positive under 30 degrees in 42%, between 30-60 degrees in 26%, and above 60 degrees in 18% of patients. Of the patients that had surgery and had a positive SLR test below 30 degrees, about 60% had a sequestered disc as seen surgically. Thus the degree of SLR limitation can discriminate contained versus non-contained disc herniation.

### Bony Vibration Test

In a study by Yrjama et al.,<sup>3</sup> 33 patients with back pain were studied with MRI, discography, and a

bony vibration procedure at a right angle to the spinous process. Painful vibration over the spinous with the patient in the decubitus position usually elicited pain in patients with annular tears as seen on MRI and discography.

The vibration was performed with an electric tooth brush at a frequency of 42-50 Hz, with two second stimulations and 2-4 repetitions. Their results revealed that in patients with partial tears of the annulus and no history of surgery there was an 88% sensitivity and 75% specificity. They concluded that when MRI shows evidence of an annular tear, and there is a painful provocative bony vibration test, the information is the same as would be provided by a discographic pain provocation test. This information may be useful in determining the clinical significance of MRI findings.<sup>4</sup>

#### McKenzie Extension/End Range Assessment

In a newly published study by Donelson and Aprill et al.,<sup>5</sup> the Mckenzie assessment and method was compared to discographic pain provocation. The patients all had discography to document the pattern of internal disc derangement. The patients were then placed into extension and the pain pattern that was evoked was then recorded as either "centralization" (diminution of the patient's referred leg pain to mostly leg pain) or "peripheralization" (increased leg pain, or more distally provoked leg pain). The authors found that centralization occurred frequently in chronic back pain patients. Most centralizers had discogenic pain with a competent intact annulus, whereas most peripheralizers had discogenic pain with outer annulus disruption.

In another study by Donelson,<sup>6</sup> centralizers were found to have superior recoveries and outcomes compared to peripheralizers. Centralization may be a marker for patients who will have a good outcome with non-operative care. This type of assessment is easy to incorporate into an exam and helps differentiate discogenic versus non-discogenic pain, as well as a competent versus incompetent annulus in symptomatic discs. Of the positive discography patients with an intact annulus (91%), 50% centralized. Of those without an intact annulus, 25% peripheralized.

Centralizers and peripheralizers had a higher rate of positive discography than those whose pain did not change on extension. The injected symptomatic discs of centralizers had a higher rate of annular incompetence than those of peripheralizers. Their study strongly concludes that centralizing pain is discogenic with a competent annulus, and that since the annulus is highly innervated, it may well be the source of pain in a high percentage of back pain sufferers.

#### References

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