

# TREATMENT OF AN L5/S1 EXTRUDED DISC HERNIATION USING SPINAL DECOMPRESSION: A CASE STUDY

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## ABSTRACT

**Objective:** To discuss a case of an acute lumbar disc herniation that was successfully treated with a spinal decompression table.

**Clinical Presentation:** A 47-year-old male presented with the chief complaint of moderate to severe lower back pain, left buttock and foot pain, and paresthesias in the left calf. Symptoms had been present for three weeks. The patient had limited lumbar flexion and a positive supine straight leg raise as well as a seated SLR for radiating buttock and leg symptoms. An MRI was performed 13 days after his injury date and revealed a large disc extrusion at L5/S1 measuring 12 mm transverse x 10 mm AP x 16 mm craniocaudal. A medical radiologist interpreted the MRI and he stated that the disc extrusion was impinging upon the left S1 nerve root.

**Treatment and Outcome:** Care in the chiropractic setting included low force adjusting procedures and spinal decompression via a Triton DTS TRT-600 unit. The patient was evaluated and screened for decompression therapy using classification analysis. The patient was also receiving concurrent physical therapy. Relief of his symptoms began soon after treatment began and the patient became asymptomatic after 15 weeks. A repeat MRI was obtained 4 months later, which showed no signs of the disc extrusion at the L5/S1 level.

**Conclusion:** Conservative treatment, including the use of spinal decompression therapy can be an effective regime for treating patients with acute lumbar disc herniations.

## CASE STUDY

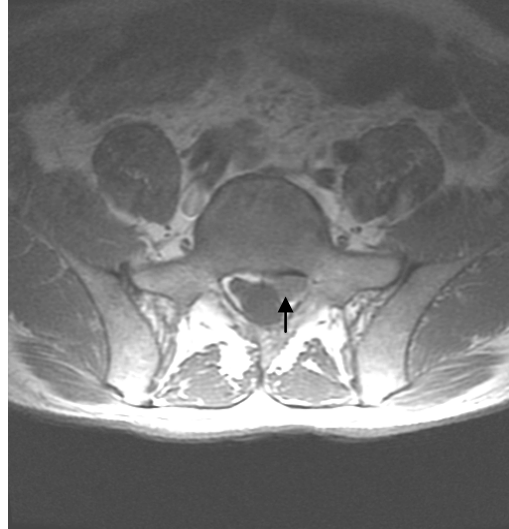
This case involves a 47-year-old male who was referred to a chiropractic office with the main complaints of lower back pain, left buttock pain, left foot pain, and paresthesias in the left calf. He had injured his back while lifting milk containers that weighed approximately 40-50 pounds and he felt a “pop” in the lower back. The patient developed immediate back/buttock pain but it wasn’t intense and he continued to work. However, his symptoms worsened and he developed left calf numbness and tingling. The patient went to the hospital 13 days after the injury and he got an MRI and was prescribed pain and anti-inflammatory medications. His MRI revealed a very large disc extrusion at L5/S1, which was measured by the radiologist (Fig. 1A & 1B). The dimensions were 12 mm transverse x 10 mm AP x 16 mm craniocaudal. There was left S1 nerve root impingement and mild indentation of the left anterolateral thecal sac. The patient was referred to a doctor at an occupational medicine clinic and he managed the work injury claim from that point. The occupational medicine doctor prescribed physical therapy and chiropractic treatment. The patient had his first chiropractic appointment 20 days after his injury and began physical therapy 8 days after chiropractic care commenced.

**Fig. 1** Pre-spinal decompression T1-weighted sagittal (A) and axial (B) MR images through the L5/S1 level (supine position). Radiologist report states there is a large left disc extrusion that impinges upon the left S1 nerve root and left anterolateral aspect of the thecal sac.

Fig. 1A



Fig. 1B



A full orthopedic and neurologic examination was performed on the patient’s first chiropractic appointment. With range of motion testing, the patient showed marked limitations of lumbar flexion but none with extension. Straight leg raise test on the left was limited to 50 degrees and created severe left buttock pain. Well leg raise was normal to 80 degrees. Braggard’s test re-created the same left buttock symptoms. Seated SLR with slump maneuver reproduced similar results to the supine SLR test. The patient demonstrated hypesthesia over the left S1 dermatome but there were no deficits of the

deep tendon patella or Achilles reflexes. The patient's motor strength for the lower extremities was recorded as normal as well. Using a system of classification analysis and McKenzie's evaluation, it was discovered that the patient's symptoms were mostly likely associated with a compressive disorder, consistent with a disc herniation. Furthermore, the testing showed a strong directional preference for lumbar extension. He tolerated prone extension very well and this position seemed to improve his radicular symptoms. Chiropractic palpation revealed marked tenderness and altered joint mechanics at the lumbosacral junction and left sacroiliac joint.

Chiropractic treatment consisted of low force treatment protocols including SOT wedges to balance the pelvis and use of the Activator adjusting instrument to affect joint dysfunction and muscle tone of the lumbar spine. Spinal decompression therapy was also initiated using protocols and methods reflective of the clinical findings as demonstrated by the classification analysis. Since the patient showed a directional preference for lumbar extension and did not have any peripheralization of his symptoms in extension, decompression therapy was started with the patient in the prone position. A Triton DTS TRT-600 unit was used for spinal decompression and the patient was scheduled for three times a week for the first several weeks. A total of eight decompression sessions were performed prone.

Within the first couple of sessions, the patient began to notice less back pain and was moving around easier. The patient experienced an exacerbation of back symptoms due to sneezing at about 14 days after treatment began. Within days of the sneezing exacerbation, the patient developed a slight weakness of his left foot evolver strength. Slightly diminished Achilles reflex was noted. The muscle strength loss coupled with the slightly diminished Achilles reflex was evidence of an S1 radiculopathy. At that time, the patient was still tolerating lumbar extension well and seemed to centralize his symptoms. Sitting and most forms of lumbar flexion bothered the patient's condition and seemed to worsen his radicular complaints. It was determined that spinal decompression would be modified to a reverse hammock posture. Reverse hammock decompression involves the patient lying prone, with both the upper back and legs elevated. This maximizes lumbar extension and potentially increases the effect of decompression for those disc herniations that favor the extension position. The patient tolerated the reverse hammock position well and this new posture for decompression was utilized on the TRT-600 unit for an additional 13 sessions.

When reversed hammock spinal decompression was started, the patient's progress escalated. He eventually stopped taking his pain medication, walked and sat pain-free, and returned to work. At 3.5 months following the onset of spinal decompression, the patient was asymptomatic and had normal lumbar range of motion in all directions. There were no positive orthopedic findings. The patient's deep tendon reflex and muscle strength for the left lower extremity returned to normal as well (Figure 2).

**Fig. 2** Post-spinal decompression T1-weighted sagittal (A) and axial (B) MR images through the L5/S1 level (supine position). There has been resolution of the prior disc extrusion. Radiologist reports states that only a 2 mm protrusion remains. These images were taken approximately 16 weeks after decompression therapy began.

Fig. 2A

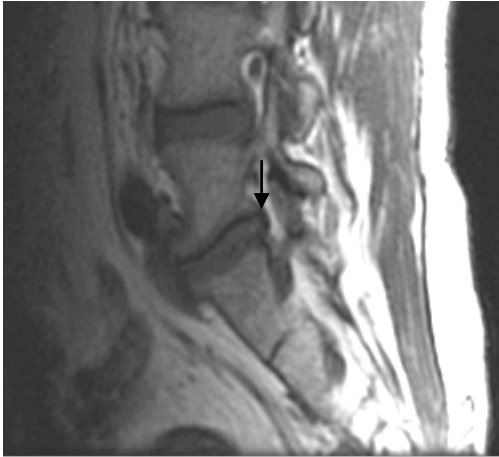
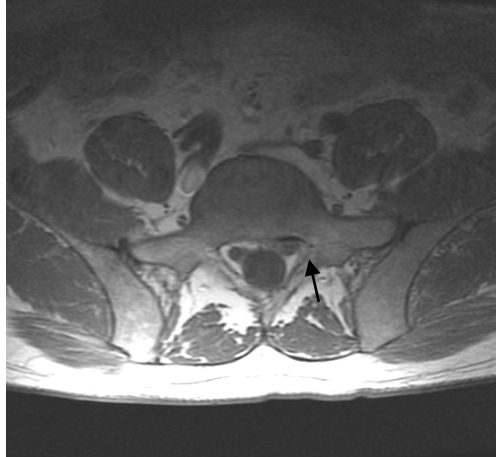


Fig. 2B



A post-MRI was taken between 3.5 to 4 months after the injury and showed no signs of the L5/S1 disc extrusion (Fig. 2A & 2B).

## DISCUSSION

Discogenic low back pain and disc herniations account for 39% and 30%, respectively, of LBP incidence. [1] Despite its relatively high occurrence in the population, very little is known about the causes and origins of these ailments. Human intervertebral discs are the largest non-vascularized structures in the body. [2] With the lack of internal blood supply, the disc relies exclusively on the diffusion of critical nutrients via small capillaries located in the vertebral endplates. This diffusion is governed by spinal movement in a process called imbibition. Basically, imbibition involves a pumping action of the disc to suck in water and remove waste products. In disc herniations, annular fibers are damaged and nucleus material escapes. Intradiscal pressure becomes reduced and in turn, reduces the ability of the disc to imbibe fluids and nutrients. Of course there is often swelling with a disc herniation and muscle splinting too—all, which contribute to symptoms such as limited movement and pain. The rationale for spinal decompression is to enhance the potential for healing via diffusion/imbibition of nutrients and a theoretic possibility of pulling extruded nuclear material centrally from peripheral fissures. [3]

Research is far from complete with spinal decompression therapy, but promising results are emerging in the literature. Apfel et al. reported a statistically significant reduction in discogenic low back pain while improving disc height using spinal decompression. [4] Gundersen, et al reports “All but two of the patients in the study improved at least 30% or

more in the first three weeks.” “Utilizing outcome measures, this form of decompression reduces symptoms and improves activities of daily living.” [5] Yochum and Maola presented a case study of a documented L5 disc extruded herniation that resolved after 2 months of decompression therapy. [6]

## **CONCLUSION**

There are a variety of treatment strategies for acute lumbar disc herniation. The number of individual conservative therapies is vast and it is not the intention here to discuss every option available to the patient or clinician. This gentleman was fortunate enough to be referred for conservative management and spinal decompression produced a complete resolution on follow-up MRI. There was certainly a strong possibility that epidural steroid shots and/or surgery would have been recommended in his case should he have failed to progress. While steroid shots and surgery have their success stories, there are also numerous cases of failed outcomes and painful side effects, some of which are permanent. Despite having an aggravation in neurological signs and symptoms from sneezing, the patient progressed over the ensuing course of treatment.

There is growing evidence of the efficacy of spinal decompression therapy. The literature is beginning to show that decompression is a valid form of treatment that is relatively inexpensive, has few side effects, and can be extremely beneficial to patients who are good candidates to receive the treatment. This patient’s results were favorable. In this case, low force chiropractic, McKenzie exercises and physical therapy were also utilized. The patient attributes his recovery primarily to spinal decompression.

## **REFERENCES**

1. Apfel, C, Cakmakkaya, O, Martin, W, Richmond, C, Macario, A, George, E, Schaefer, M, Pergolizzi, J. Restoration of disc height through non-invasive spinal decompression is associated with decreased discogenic low back pain: a retrospective cohort study. *BMC Musculoskeletal Disorders* 2010; 11:155.
2. Moore, RJ. The vertebral endplate: disc degeneration, disc regeneration. *Eur Spine J.* 2006; August: 15(Suppl 3): 333-337.
3. Kennedy, J. What is a decompression technique? *D.C. Products Review* 2009; February: 48-51.
4. Apfel, et al (see #1).
5. Gundersen, B, et al.: A clinical trial on non-surgical spinal decompression using a vertebral axial distraction delivered by a computerized traction device. *Academy of Chiropractic Orthopedists; Quarterly Journal of ACO*; 2004: June.
6. Yochum, TR, Maola, CJ. Treatment of an L5/S1 extruded disc herniation using a DRX-9000 spinal decompression unit: A case report. *Chiropractic Economics* 2007; Volume 53:2.