Management of Low-back Pain with a Non-surgical Decompression System (DRX9000™) – Case Report

a report by
Joseph V Pergolizzi Jr,1 Frank Florio,2 William R Martin3 and Charlotte Richmond4

1. Adjunct Assistant Professor, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore; 2. Director of Clinical Research, Axiom Worldwide, Tampa; 3. Medical Director, Upper Valley Interventional Radiology, McAllen; 4. Director of Clinical Research, NEMA Research, Inc., Miami Beach

Chronic low-back pain (LBP) is a widespread and debilitating syndrome. Approximately 25% of adults in the US report having experienced LBP in the past three months.1 LBP is the second most common reason for a visit to a physician, the fifth most common cause of admission to a hospital, the third most common indication for surgery,2 among the top 10 reasons for visits to internists and the most common and most expensive reason for work disability.1 While there are three broad treatment options for treating LBP – surgical, non-surgical and pharmacological – there is little consensus on which approach is appropriate or preferable for various scenarios. Current evidence-based guidelines recommend conservative treatment for at least two months, and often for much longer, before a surgical option is considered.4,5 Surgery is associated with risks, and the outcome in many patients with discogenic back pain is unpredictable. Conservative treatments vary widely and are individualised to the patient. These include exercise, yoga, cognitive behavioural therapy, analgaesics, superficial heat therapy, patient education/back school, muscle relaxants, systemic corticosteroids, opioids, spinal manipulation, acupuncture, acupressure and transcutaneous electrical nerve stimulation. More recently, a variety of mechanised and motorised spinal decompression systems have been developed to address the pitfalls of the aforementioned therapies. The first of these was the Vertebral Axial Decompression (VAX-D) system (Val-Tech, Inc.). Several other devices have since been developed, including the DRX9000™ (Axiom Worldwide, Tampa, Florida). The DRX9000 computerised non-surgical spinal decompression system was designed to provide maximum patient benefits with the use of a non-invasive approach that may help minimise healthcare resources and offer a potentially optimal therapeutic approach to the treatment of LBP.

The DRX9000 aims to relieve pain by enlarging intra-discal spaces, reducing herniation and decreasing intra-discal pressure during treatment. A retrospective chart audit of 94 patients provided preliminary data that chronic LBP may improve with DRX9000 spinal decompression.6 A prospective trial with 18 patients found that pain improved significantly after DRX9000 treatment, with patients requiring fewer analgaesics and experiencing better function.7 Information continues to emerge on non-invasive spinal decompression. Christian C Apfel and colleagues at the University of California at San Francisco conducted a retrospective review of lumbar computed tomography (CT) scans of 16 patients with chronic musculoskeletal, mechanical or discogenic LBP who underwent a six-week course of non-invasive spinal decompression treatment using the DRX9000. Dr Apfel’s investigation showed a significant reduction in chronic LBP after non-invasive spinal decompression correlated with an increase in disc height.8 The case report presented here explores the use of the DRX9000 non-surgical spinal decompression protocol for the management of chronic LBP.

Presentation of Case
A 69-year-old man, patient A, presented at an outpatient facility in October 2007. He complained of having experienced LBP during the past year. Patient A said the pain had progressively worsened over the past two months. Patient A also reported radiating pain into the buttocks and legs, as well as a burning sensation down both legs into the feet and the right inguinal region. Patient A was 68 inches tall and weighed 192 pounds. His medical history revealed cervical spine surgery, diabetes, hypertension and lumbar surgery 13 years previously. Activities that exacerbated patient A’s condition included walking and standing for more than 15 minutes. The pain disrupted his sleep and he had difficulty moving from a sitting to a standing position. Magnetic resonance imaging (MRI) of the lumbar spine performed on 4 October 2007 showed disc protrusions at all lumbar levels with degenerative changes throughout; the size of patient A’s herniated disc and height of his disc space at first visit are shown in Table 1. Patient A underwent 22 treatments on the DRX9000 over a seven-week period. The initial parameters began at a maximum decompressive force of 80 pounds, with a minimum force of 40 pounds; the final treatment parameters were a maximum of 125 pounds and a minimum of 62 pounds. The decompressive force was raised in increments of five pounds at the discretion of the physician. The angle of treatment force – which allows the physician to make adjustments to treat the affected lumbar region – ranged from 10 to 20º. Adjunctive treatment included electric stimulation, as well as instruction on therapeutic exercise and nutritional support upon discharge. At initial treatment, patient A reported pain at ‘10’ on a scale of 0 to 10; at the end of the treatment protocol he reported pain at ‘1’. Post-treatment, patient A stated that he no longer felt the burning sensation in the buttocks or legs and noticed a decrease in the frequency of burning in the right inguinal region. At final evaluation, the examiner also noted an improvement in patient A’s muscular strength and sensation to pinprick. MRI of the lumbar spine performed on 28 January 2008 – four months after the initial visit – revealed decreased herniation size and increased disc height at multiple lumbar levels (see Table 1 for patient A’s pre- and post-treatment MRI measurements, and Figure 1 for pre- and post-treatment MRIs of patient A’s lumbar spine).

Discussion
Spinal decompression systems such as the DRX9000 have become more prominent in clinical practice for the treatment of LBP. These systems were developed to provide a non-invasive intervention for the treatment of LBP of discogenic origin, with the goal of expanding the intervertebral space and reducing disc protrusion. As described by Richmond et al. in 2007, “the DRX9000 True Non-surgical Spinal Decompression System™ applies spinal distraction forces by using a sensitive computerised feedback mechanism to provide relief of LBP and symptoms associated with herniated discs, bulging or protruding inter-vertebral discs, degenerative disc disease, posterior facet syndrome and sciatica. The DRX9000 uses a split-table design to reduce friction between the patient and the device. The patient lays supine, a chest and shoulder support system controls the upper body and a knee rest is used to eliminate pelvic rotation. The apparatus has built-in air bladders, disc-angle-pull adjusters and harnesses and can increase the decompression force.
Table 1: Pre- and Post-treatment Magnetic Resonance Imaging Measurements for Patient A

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<th>L4–5</th>
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<tr>
<td>Date</td>
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<td>Height of Disc Space (mm)</td>
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<td>1.6 (right)</td>
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<td>8.4</td>
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MRI = magnetic resonance imaging; Tx = treatment.

Figure 1: Pre-DRX9000 Lumbar Magnetic Resonance Imaging (MRI) Scan (A) and Post-DRX9000 Lumbar MRI Scan (B)

Conclusions

Evidence-based data that show the promising effects of DRX9000 on the safe and effective treatment of LBP continue to accumulate. This case report further builds on previous findings that have demonstrated improvements in disc morphology after treatment with the DRX9000. Patient A experienced pain relief, protrusion reduction and disc space enlargement with treatment. To further test the effectiveness of DRX9000 on clinical and radiographic measures in patients with chronic LBP, additional prospective clinical studies are needed.