Changes in a Lumbar Disc Extrusion After Cox® Technic Flexion Distraction Therapy in a 44 year old Office Worker: Pre and Post MRI Images

Submitted by
Dr Joel Dixon B.App.Sc (Chiropractic) J.P.
Melbourne Spine Clinic
Melbourne, Australia
and
Dr Chloe Wilkinson B.BiomedSc, BHsc(Chiro), MClinChiro (Dist)
Malvern Chiropractic Clinic
Melbourne, Australia

HISTORY
This patient is a 44 year old male who presented to the Malvern Chiropractic Clinic on April 2nd, 2015, with right-sided low back pain radiating into the posterior thigh, leg and foot, with numbness distributed over the same pattern.

The pain started three weeks prior on March 11, 2015; he was admitted to the Alfred Hospital, Melbourne, Australia, for pain management and was discharged the same day. His condition had been described as a disc bulge with sciatic radiation.

The patient described the pain intensity as a 3/10 VAS scale with a stable nature, aggravated with tennis, when getting out of his vehicle and lifting and only relieved by lying in a supine position. He reported that the pain was interfering with his normal daily routine (ADL’s) including sleep, work and exercise.

There is a previous history of low back pain 20 years prior following a football injury, believed to be the same spinal vertebral level, with previous treatment administered by an osteopath and physiotherapist.

His last therapy prior to consultation was by a physiotherapist 3 weeks prior. The patient had consulted with a neurosurgeon who had recommended microdiscectomy at L5/S1 level.

PHYSICAL EXAMINATION (02.04.15)

Palpation:
Bilateral spinal muscle contracture from levels L3 to S1 with right leg, posterior thigh, posterior calf and foot pain.

Range of Motion:
Active and passive lumbo-sacral range of motion was diminished by up to 50% in all 3 planes of movement.

Orthopaedic examination:
Seated straight leg raise- right side positive at 60 degrees and 70 degrees on the left.
Kemps test was positive on the right side and a functional short leg was positive on the right side by up to 20mm.

Neurological examination:
L4 deep tendon reflex right +1, left +2
L5 deep tendon reflex right 0, left +1
Myotomes: Extensor hallucis longus (EHL) right side weakness compared with left
Dermatomes- right side dermatomal distribution demonstrates paraesthesia and anaesthesia patterns
IMAGING
Three lumbo-sacral spine MRI’s were conducted on the 30th March 2015, 6 weeks later on 14th May 2015 and 5 months later on the 25th November 2015.

The initial films revealed a very large disc extrusion of L5/S1, lying posterior to the S1 nerve at disc level, compressing it anteriorly against the disc. There is a large volume of abnormal tissue following the S1 nerve down into the S1/2 lateral recess. See Figures 1, 1a, and 1b.

MRI LUMBAR SPINE
Clinical History: Absent right ankle reflux, weak right plantar flexion.

Technique: Sagittal and axial T1, T2 and fat suppressed post-contrast T1, axial proton density lumbar spine.

Findings: There is a large volume of abnormal soft tissue occupying the right side of the spinal canal, right lateral recess and extending downwards into the right S1/2 lateral recess. It is moderately hypointense on T2 and demonstrates a thin rim of peripheral enhancement, consistent with a large disc extrusion with early infiltration with vascular granulation tissue. There is a small 3mm fleck of quite marked T2 hypointensity within the process which is likely to be a tiny focus of calcification, as the process appears too chronic to be likely to have a component of haemorrhage within it. The extrusion is atypical in that it has dissected laterally and then posteriorly behind the right S1 nerve, compressing it forwards against the L5/S1 disc, which itself demonstrates moderate disc bulging. Quite marked abnormal enhancement of the right S1 nerve is seen as far up as the L3/4 level, in keeping with the effects of mechanical compression of the nerve.

Conclusion: A very large disc extrusion arising from the L5/S1 disc compresses the right S1 nerve. Of note it is in atypical position, lying posterior to the S1 nerve at the level of the disc, compressing it forwards against the disc rather than displacing it posteriorly as is more typically the case. In addition, disc material follows the S1 nerve down into the S1/2 lateral recess.
This may be relevant if surgery is undertaken.

Figure 1

March 2015 - Lumbar MRI taken March 30, 2015, shows the large right sided L5-S1 disc fragment that impinges the S1 nerve root.
The following MRI taken 6 weeks later on May 14th, 2015, found a moderately reduced disc height of L5-S1 disc with discophyte anteriorly and a spur in the right L5 foramen not contacting the L5 nerve. This was much improved in comparison with previous imaging. See Figures 2, 2a, and 2b.

LUMBAR MRI

Clinical Notes: Right sciatica L5/S1 disc.

Previous lumbar spine imaging on 30th March 2015 demonstrated large L5/S1 disc extrusion compressing the right S1 nerve.

Findings: At L5/S1 disc height is moderately reduced with a circumferential discophyte more prominent anteriorly. There is a broad based discophyte in the midline and to the right postero-laterally. This contacts the ventral margin of the thecal sac but does not contribute to a significant canal stenosis. There is a small spur extending into the right L5 foramen approaching but not definitely contacting the exiting L5 nerve root.

The disc/spur margin contacts the ventral aspect of the descending S1 nerve root as it buds from the thecal sac. There is loss of peri-neural fat and the right S1 nerve root is diffusely mildly swollen at and more so just below the disc level in the subarticular recess.

With reference to the previous report this sounds much improved.

There is no convincing left L5/S1 nerve root impingement.

The L4/5, L3/4 and L2/3 discs demonstrate minor degenerative change. At L4/5 there is a very small relatively shallow disc bulge which does not impinge upon thecal sac exiting or descending nerve roots.

Figure 2 – MRI Report

Figure 2 a – May 2015

May 2015 – Repeat lumbar MRI taken May 14, 2015, shows marked reduction in the L5-S1 disc fragment and now able to envision the S1 nerve root.

The last MRI conducted on November 25th, 2015, showed a mild broad based L5/S1 disc bulge with right postero-lateral annular fissure. There was mild contact and displacement of the right S1 nerve. Scarring and thickening around the right S1 nerve had decreased since previous imaging. Degenerative end plate change and desiccated L5/S1 disc were evident. See Figures 3 and 3a.
Figure 3 – MRI Report

Figure 3a – November 2015 MRI – Note the major reduction in the size of the L5-S1 disc fragment seen on the March 30, 2015 MRI study.

TREATMENT

The patient was treated with Cox® Technic flexion-distraction spinal decompression therapy protocol 1 consisting of long axis/y axis distraction and protocol 2 including circumduction motions (5x4 decompression sets), both focusing on the right sided discal compartment. Soft tissue therapy and a prescription of core stabilizing exercise and stretching routine were also administered.
The initial course of care was twice weekly for 5 weeks, once weekly for a following 4 weeks and once fortnightly between April 2015 and January 2016, with 40 treatments in total, maintaining an 80-100% reduction in pain.

Cox® flexion distraction, disc decompression therapy has been demonstrated to both diminish the size and pain impact of the discal pathology and its further impact on the compromised DRG.

**PROGNOSIS**

Patient progress has been excellent and he is expected to return to all normal ADL’s including non-ballistic recreational activity.

It was explained to him that long term success was a result of a balance between an active and passive mobility programme and hence he has been given appropriate stretching and core strengthening routines.

We have also assessed and modified workplace and domestic ergonomics.

I am confident that self-management along with supportive Cox® Decompression therapy will maintain this patient’s low back condition well and help him get on with pain free ADL’s.

**CONCLUSION**

The appropriate application of Cox® flexion-distraction therapy protocols in this case has
1. Significantly reduced both signs and symptoms associated with discal compartment pathology and the associated Dorsal root ganglion compression consequences.
2. Resulted in the MRI changes demonstrated over three separate images over a period of some 7 months.
3. Significantly reduced intradiscal pressures at L5-S1 level and a tightening of the posterior longitudinal ligament (1,2,3,4) may explain the reduction in discal mass extrusion posterolaterally into spinal recesses at this level.

**References**

1. Cox JM: Low Back Pain: Mechanism, Diagnosis, Treatment, 6th edition, Baltimore; Lippincott Williams & Wilkins, 1990, Chapter 8, Appendix B.