Repeate MRI and Disc Bulges/Herniation

So many therapists week in and week out at seminars and conferences, ask us for references and updated research. At ISPI we have no problem helping therapists with such requests. The following is a great example of this.

In our courses, it is often stated that repeat MRI or serial MRI on people with LBP due to disc bulges/herniations, will show the disc fluid being reabsorbed and “slowly disappear.” In response to questions for references, we thought it would be good to look up a few articles and pass it along to therapists. The neat thing, is that this phenomenon is widely presented and taught by spine surgeons.

Serial magnetic resonance imaging follow-up study of lumbar disc herniation conservatively treated for average 30 months: relation between reduction of herniation and degeneration of disc.
J Spinal Disord. 1996 Jun;9(3):251-6

Serial magnetic resonance imaging studies were performed an average of 4.4 times in 30 patients in a 30-month-average period. The Japanese Orthopaedic Association (JOA) score and straight leg raising (SLR) test were improved, with the average reduction ratio of the herniation 15 and 18% on the sagittal and axial images, respectively.

Risk factors for lumbar disc degeneration: a 5-year prospective MRI study in asymptomatic individuals.

Forty one individuals had a magnetic resonance imaging scan at baseline and at the minimum 5-year follow-up assessment using the same scanner and protocol. The magnetic resonance images were analyzed independently by two radiologists with regard to disc degeneration.

Of the 41 individuals, 17 (41%) exhibited a deterioration of the disc status. In 10 individuals, the progression of disc degeneration was one grade or more. Only a weak correlation existed between progressive disc degeneration and low back pain development during a 5-year follow-up period.

Regression of cervical disc herniation observed on magnetic resonance images.
Spine 1998 May 1;23(9):990-5

Thirty-eight patients with cervical disc herniation who underwent repeated magnetic resonance imaging examinations were studied. The changes over time in herniated disc size were evaluated using this imaging technique.

In 15 patients (40%), the volume of herniated material was decreased.

CONCLUSION: Although the possibility of the combination of hemorrhage and disc material could not be denied, active resorption of herniated material probably occurred during the acute phase. Extruded material exposed to the epidural space may be resorbed more quickly than that beneath the ligament. Vascular supply probably plays a role in the mechanism of resorption. The phase and position of extrusion were the significant factors affecting cervical disc herniation resorption.

Natural History of Patients with Lumbar Disc Herniation Observed by Magnetic Resonance Imaging for Minimum 7 Years.

Objective: The aim of this work was to elucidate the relation between the clinical course and morphologic changes of lumbar disc herniation on magnetic resonance imaging.

Methods: 21 patients with lumbar disc herniation treated nonsurgically were followed for a minimum of 7 years and investigated with regard to their clinical outcome and the initial, 2-year, and final stage MRI findings. The space-occupying ratio of herniation to the spinal canal and the degree of disc degeneration were evaluated on serial MRI.

Results: The mean space-occupying ratio of herniation showed significant reduction both on the 2-year and on the final scans. Progression of degeneration of the IVD was seen in all patients at the final investigation. Comparing patients with and without symptoms, no factors were detected on the initial and 2-year MR images capable of distinguishing patients who were and were not destined to develop lumbago and/or sciatica in the future. Morphologic changes of lumbar disc herniation continued to occur even after 2 years.

Conclusions: Clinical outcome did not depend on the size of herniation or the grade of degeneration of the intervertebral disc in the minimum 7-year follow-up. Sagittal images of L4-L5 disc herniation in a 46-year old woman with lumbago at the final investigation. There was posterolaterally located disc herniation in the initial stage (A). A faint reduction was observed 2 years later (B). More reduction was observed in L4-5 disc, and degenerative disc changes occurred in involved and closed discs 8 years later (C).
Serial changes on MRI in lumbar disc herniations treated conservatively
Using serial MRI, we studied 32 patients with herniated lumbar discs, treated conservatively, to clarify the natural history of this condition. MRI was performed in the acute stage, then 6 months and 1 year later. On axial images, the proportion of the cross-sectional area of the spinal canal occupied by the herniated disc was 31.9% on the average on the initial scan, 28.7% 6 months and 25.3% 1 year later. The size of the herniation decreased by more than 20% in 11 patients (34%), by 10-20% in 8 (28%) and was unchanged in 12 (38%). The height of the disc slightly decreased with time, but there was no significant change in the angle of lordosis in the affected segment.

Contrast-enhanced magnetic resonance imaging in conservative management of lumbar disc herniation.
The study population consisted of 48 patients with radiculopathy. All patients primarily reported unilateral leg pain, and 94% had positive tension signs. Additionally, 38% exhibited muscle weakness corresponding to the symptomatic nerve root. All patients were studied twice or more using gadolinium magnetic resonance imaging during conservative therapy, at a mean interval of 191 days. Changes in the size of the herniated nucleus pulposus on pre-contrast images fell into four categories, with changes in enhancement on postcontrast images classified into two categories: "enlargement" and "no change."
In all cases of migrating type herniated nucleus pulposus, circular enhancement was seen on post-contrast images. In 17 of 22 cases, the enhanced area gradually thickened and intruded into the migrated disc materials as the size of the herniated nucleus pulposus decreased; the herniated nucleus pulposus disappeared in nine cases and showed a marked decrease in seven cases. These cases showed good clinical courses of sciatica. In the other five patients, in whom there were no changes in the enhanced area, there was less of a tendency for the herniated nucleus pulposus to decrease in size, and there were poorer clinical results. In six cases of extruding-type herniated nucleus pulposus, no enhanced effects were observed throughout the follow-up period.

Magnetic resonance imaging and clinical follow-up: study of 27 patients receiving chiropractic care for cervical and lumbar disc herniations.
Twenty-seven patients with MRI-documented and symptomatic disc herniations of the cervical or lumbar spine. All patients were evaluated before commencement of chiropractic care by MRI scans for presence of disc herniations. Pre-care evaluations also included clinical examination and visual analog scores. Patients were then treated with a course of care that included traction, flexion distraction, spinal manipulative therapy, physiotherapy and rehabilitative exercises. All patients were re-evaluated by post-care follow-up MRI scans, clinical examination and visual analog scores. Percentage of disc shrinkage on repeat MRI, resolution of clinical examination findings, reduced visual analog pain scores and whether the patient returned to work were all recorded.
Clinically, 80% of the patients studied had a good clinical outcome with post-care visual analog scores under 2 and resolution of abnormal clinical examination findings. Anatomically, after repeat MRI scans, 63% of the patients studied revealed a reduced size or completely reabsorbed disc herniation.