

MRI documentation of Spontaneous Regression of lumbar disc herniation- A case report.

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Abstract

Spontaneous regression of a herniated nucleus pulposus (HNP) occurs where intervertebral disc herniation loses its volume partly or totally without surgical interventions. In 1985, Teplick and Haskin first documented the spontaneous resolution of lumbar disc by computerized tomography and they reported that 9 out of their 55 patients harboring lumbar disc herniation showed spontaneous regression.¹The gold standard modality for visualizing the herniated disc is MRI these days. The following case reports the MRI documentation of spontaneous disappearance of acute lumbar disc extrusion in a patient treated conservatively.

CASE REPORT

A 44 years old male patient presented to outpatient department of orthopedics department of our hospital with chief complaints of sharp, burning pain and stiffness of lower back radiating to left upper thigh and upper leg. Pain was associated with numbness and tingling sensation and used to increase with walking and lumbar flexion and relieved with rest. No history of bowel or bladder dysfunction was there. No other positive relevant history was there.

On physical examination, muscle spasm was there in lower back. Straight leg raising test and femoral stretch test were positive. Sensory loss was there in left posterolateral thigh and upper leg. Power in left quadriceps muscle was grade III with diminished patellar reflex. Provisional diagnosis of disc disease with nerve root compression was kept.

MRI examination was recommended. Dedicated MRI of lumbar spine was done with high resolution axial and sagittal images using T1W, T2W and STIR sequences. MRI revealed mild straightening of lumbar lordosis with disc desiccation in lower lumbar discs. Height of L3-4 disc was reduced with Modic type II end plate changes. Diffuse disc bulge with left paracentral disc extrusion and superior migration of herniated nucleus pulposus was observed at this level causing compression of thecal sac and left L3 traversing nerve root (Fig. 1 and 2).

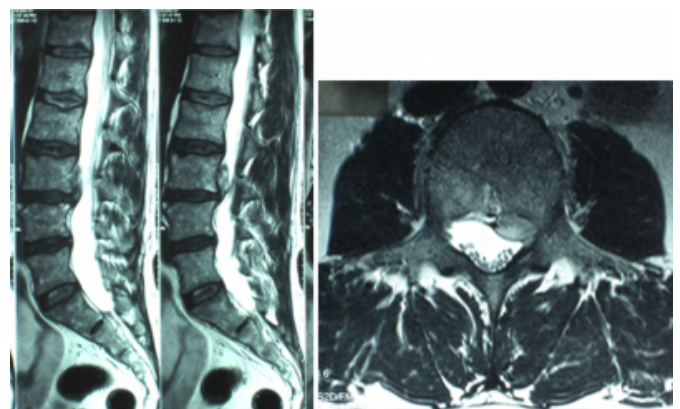
The patient was put on the trial of conservative treatment in

the form of bed rest, analgesics, muscle relaxants and aerobic exercises.

Six months later, patient came for follow up and was asymptomatic. On physical examination, straight leg raising test and femoral stretch tests were negative. Power in all the muscles was grade V with normal tendon reflexes. No sensory loss was seen.

Repeat MRI scan was done which showed complete resolution of extruded disc fragment (Fig 3 and 4). Mild diffuse disc bulge left without any significant neural compression.

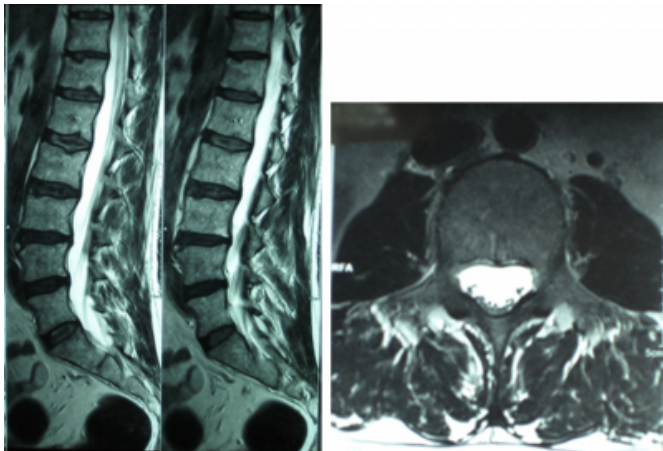
Figure 1



Sagittal (figure 1) and axial (figure 2) T2W MR demonstrate left paracentral disc extrusion with superior migration causing compression of thecal sac and left L3 traversing

nerve root

Figure 2



Follow up sagittal and axial T2W MR (figure 3 and 4) shows complete resolution of extruded fragment

DISCUSSION

Spontaneous regression of herniated discs in lumbar region has been well established previously. Occasionally the herniated fragment may completely disappear. In 1945, Key first documented the spontaneous regression of a herniated disc by myelography.²

Recent advances in imaging techniques (CT, MRI) have facilitated the precise documentation of this fact.³

Exactly how an HNP decreases in size remains a subject for speculation. Histological studies have shown an inflammatory reaction around the HNP.

Local production of TNF alpha by schwann cells, endothelial cells, fibroblasts and mast cells attracts macrophages to the site of injury.⁴

Neovascularisation has also been reported at the edge of HNP.⁵ Both inflammation and neovascularisation are thought to be required for phagocytosis.⁶ Macrophage infiltration seems to be prominent in large disc herniations, as sequestrations have 2-3 times more inflammatory cells than extrusion type herniations.⁷ Neovascularisation is also most abundant in extrusions and sequestrations and is hindered by ligaments and/or annulus fibrosus.⁵ Therefore it is seen that both generalized and localized bulges have the poorest potential to regress.

There is a wide spectrum of potential outcomes among patients with herniated discs. In some patients the symptoms may resolve without radiological regression. Another group

of patients may have a radiological regression of herniated disc without clinical improvement. In patients that have clinical improvement without radiological regression, it is possible that morphological regression lag behind the clinical movement. A future MRI could show morphological improvement. In other type of patients, in addition to mechanical compression, biochemical substances released by the disc, such as phospholipase -A2 and nitric oxide, have been thought to play a role in nerve inflammation and pain which may persist after the resolution of disc herniation.⁸

In a large proportion of patients conservative treatment relieves pain in a few days to several months. Hakelius analyzed retrospectively 417 patients treated conservatively by bed rest, a corset and physiotherapy and 166 who had surgery. He observed that in the initial months the percentage of patients improved was more with surgical treatment as the results are immediate and hence time away from work was less, however in the long term, results were only slightly better in patients treated surgically.⁹

The proportion of satisfactory results after repeated discectomy is not certain. In numerous studies the satisfactory outcomes ranged between 77%-85%. Small recurrent herniations and epidural fibrosis are more often associated with unsatisfactory results.

However, with prolonged conservative treatment, there is certainly a risk of the patient developing myelomalacia and cord atrophy leading to secondary neurological deficit.⁸

In spite of these facts, as the long term results of both types of treatments are comparable, these days absolute indications of surgery are in those patients with cauda equina syndrome and in the presence of severe motor deficits of recent onset and/or intractable pain.

In all other patients, the indications for surgery are relative and depend upon: -The duration of symptoms, the type and size of the herniation, the presence of stenosis of the nerve-root canal or central spinal canal and the quality and severity of symptoms.¹⁰

CONCLUSION

The case presented here underlines the value of conservative management of herniated discs and the likely etiology behind the resolution of symptoms. In all the patients with large herniations, extrusions and sequestrations a trial of conservative treatment should be given. Serial MRI scans

are indicated after a trial of conservative treatment to document regression or diminution of herniated disc fragments.

References

1. Teplick JG, Haskin ME: Spontaneous regression of herniated nucleus pulposus. *AJR* 145: 371-375, 1985.
2. Key JA. The conservative and operative treatment of lesions of the intervertebral discs in the low back. *Surgery* 1945;17:291-303.
3. Sei A, Nakamura T, Fukuyama S et al: Spontaneous regression of lumbar hernia of the nucleus pulposus. Follow-up study of 4 cases by repeated magnetic resonance imaging. *Rev Chir Orthop Reparatrice Appar Mot* 1994;80:144-49.
4. Olmarker K & Larsson K .Tumor necrosis factor alpha and nucleus-pulposus- induced nerve root injury. *Spine* 1998;23:2538-44.
5. Ozaki S, Muro T, Ito S & Mizushima M. Neovascularisation of the outermost area of herniated lumbar intervertebral discs. *J Orthop Sci* 1999;4:286-92.
6. Haro h, Kato T, Komori H, Osada M & Shinomiya K. Vascular -endothelial growth factor (VEGF) induced angiogenesis in herniated disc resorption. *J Orthop Res* 2002;20:409-15.
7. Virri J, Gronblad M, Seitsalo S, Habtemariam A, Kappa E & Karaharju E. Comparison of the prevalence of inflammatory cells in subtypes of disc herniations and associations with straight leg raising. *Spine* 2001;26:2311-5.
8. Federico C, Vinas , Harvey Wilner, Setti Rengachary. The spontaneous resorption of herniated cervical discs. *Journal of Clinical Neuroscience* 2001;10;1054/jocn.1-5.
9. Hakelius A. Prognosis in sciatica; a clinical follow up of surgical and non-surgical treatment. *Acta Orthop Scand Suppl* 1970:129.
10. F.Postacchini. Rewiew article- Management of herniation of the lumbar disc. *J Bone Joint Surg* 1999;81-B:567-76.

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