Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2015; 3(5B):1918-1921 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublisher.com

Case Report

Spontaneous Regression in Herniated Lumbar Disc: Mechanism and Prognostic factors

Emre DELEN, MD[1]*; Tulin Coskun, MD[2]
[1]Edirne State Hospital, Departmant of Neurosurgery, Edirne, Turkey
[2]Uzunkopru state hospital, Departmant of Neurology, Edirne, Turkey

***Corresponding author**
Emre DELEN
Email: emredelen1979@yahoo.com

Abstract: Although there are publishings about the natural course of lumbar disc herniation, the natural course of this disease has not been proved literally. Spontaneous regression, which can be seen in natural course of lumbar disc hernias, takes place in literature frequently and draws attention in recent years. In clinical studies submitted in literature, it is identified that spontaneous regression between percentages 50-70% has been seen. The general opinion is that this percentage is valid mostly for the transligamentous discs. There is no certain agreement about the whole mechanism in question. Besides, the clinical studies to determine the prognostic factors is not enough. In this article, two lumbar disc hernia case showing spontaneous regression will be submitted accompanied with the literature, its mechanism and prognostic factors will be evaluated.
Keywords: Lumbar vertebrae, hernia, spontaneous regression.

INTRODUCTION

The patients with back and foot pain related to lumbar disc herniation, include the patient group who often consults neurosurgery polyclinic. The treatment protocol of this disease consists of medical nonsurgically treatment, physical treatment and surgical treatment. But there is no certain agreement regarding the most effective treatment approach in question[1]. Spontaneous regression which can be seen in natural course of lumbar disc disease, is first identified by Key in 1945, later on, this phenomenon has taken place frequently in literature. In this article, a case with lumbar disc hernia showing spontaneous regression has been discussed accompanied with literature, its mechanism and prognostic factors are examined.

CASE REPORT

Case 1

53 year old male patient. He consulted our polyclinic because of his sharp back and left foot pain that keeps going for the last 1 week. As a result of the neurologic examination of the patient, his straight-leg-raising test has been positive in 30 degrees, his left ankle is 40-50 % lost in dorsiflexion and L5 hypoesthesia is identified. Because of the patient's sharp ache, he had medical treatment of pain relief of opioid group. In the patient's Lumbar MRI (Magnetic Resonance Imaging) as a result of his existing complaints, fragmente disc has been identified that is placed in left side at the level of L4/5, closing neural foramen, emigrate in apical direction. (Figure 1) The patient has been offered a surgical treatment. The patient did not accept the surgical treatment. In the polyclinic control that has been done 8 months later, it has been identified that the patient is not complaining anymore and there is not any deficit in his neurologic examination. As a result of his control MRI, it has been identified that his lumbar disc herniation in his old radiological imaging is spontaneous regress. (Figure 2)

Case 2

29 year old male patient. He consulted our polyclinic because of his back and left foot ache that keeps going for the last 5 days. As a result of his neurologic examination, his straight-leg-raising test has been identified positive in 45 degrees. There was no motor and sense deficit. As a result of his MRI, extrude disc compression has been identified that compresses neural foramen, placed on the left side at the level of L5/S1. (Figure 3) The patient has been offered medical treatment. As a result of the neurologic examination of the patient, as he reconsulted the polyclinic 4 months later because of his sharp complaints, no additional new neurologic deficit has been identified. In the MRI control of the patient, spontaneous regression is identified of the lumbar disc herniation found in his old radiologic imaging. (Figure 4) But it is identified that the patient's pains continued increasingly.

Fig 1: Sagittal and axial T2-weighted MRI of the lumbar spine images show a large extruded disc fragment on the left side at the L4-L5 level (white arrow).

Fig 2: Sagittal and axial T2WI MRI after 8 months showed almost complete regression of the large extruded disc fragment at the L4/5 level without nerve root compression.

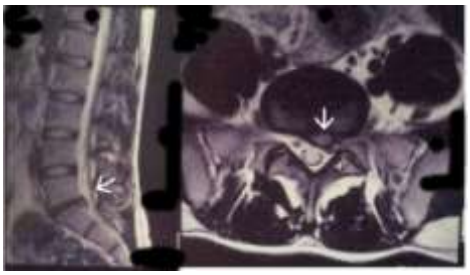

Fig 3: Sagittal and axial T2-weighted MRI of the lumbar spine images show an extruded disc fragment on the left side at the L5-S1 level.

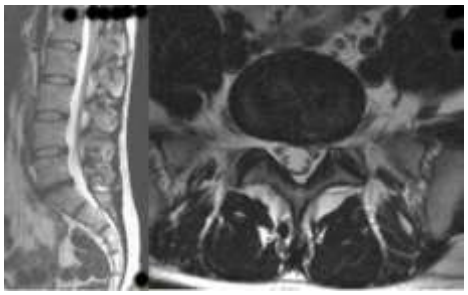

Fig 4: Sagittal and axial T2WI MRI after 4 months showed almost complete regression an extruded disc fragment at the L5-S1 level without nerve root compression.

DISCUSSION

As well as the general view in the treatment approach of lumbar disc herniation differs from the doctor's clinical experiences, is to administer surgical treatment to patient groups who have intolerable aches, medium level neurologic defisit and radicular foot ache that continues despite the medical treatment for 6 weeks [2]. But nonsurgical treatment and the difficulties in ache control results in surgical treatment for the patients who have acute aches. In spite of the fact that the surgical treatment in a short period has been the most effective treatment option in removing the acute ache, the long period results of the clinical studies in literature supports nonsurgical treatment or at least it shows that the results are similar [3].

Although there are publishings about the natural course of lumbar disc herniation [4], the natural course of this disease has not been proved literally. As well as MRI is used clinically and becomes easy to reach, spontaneous regression seen in natural course of lumbar disc disease has been reported and drawn attention frequently. In studies of clinical patient series, it has been reported that spontaneous regression has been seen in 50-70 % of the patients [5,6]. In some other studies, it is found out that this percentage is over 70% [4,7]. These percentages are valid for transligamentous discs which involves extrude and sequesterant discs identified by Grenier [8]. They are not valid for other group subligamentous discs (bulging and protrusive discs). It is found out that bulging discs remain stable for 1 year and spontaneous regression is seen in low percentages such as 26% in protrusive discs [9]. The reason why the spontaneous regression percentages are more in transligamentous discs may be the existing rupture in PLL. An array of inflammatory reactions are in question, where the nucleus pulposus part results / starts, leading to epidural area, which is embriologically different. At the same time, a foreign body reaction occured in that area may have caused this situation.

Some studies in literature have reported that there is no significant correlation between clinical and radiological recovery [5]. But intervertebral disc cases which are generally spontaneous regress, appear together with significant clinical relief after acute ache period when the symptoms are seen at the sharpest level. Many cases taking place in literature shows that it includes the patient groups who were offered a surgical treatment but did not accept during this aching period [10,11,12]. In presentations of some cases, it is reported that not only the pain of the patients who had a medical treatment has gone but also there has been a decline in their neurological deficits [12]. In the first case we presented, the complete recovery in the patient's existing neurologic deficits is remarkable.

The suggested views regarding the mechanism of spontaneous regression is withdrawal of herniated nucleus part, disappearing of herniated part by losing its water content and getting smaller and disappearing of the disc part that reaches epidural space as a result of enzymatical destruction and phagocytose, establishing

an inflammatory response [13,14]. In animal and surgical specimen studies carried out in recent years, the last view suggested has been supported [15,16]. Intervebral disc which loses its waterholding ability in time, becomes completely avascular in future years of life and are known as the biggest avascular tissue of the body. Intervebral disc, which have no systemic circulation, therefore of which the body immune system is not recognized, becomes recognizable by immune system after extending to epidural area that have systemic circulation and a foreign body reaction occurs in that region. In spite of the fact that this agreed and supported theory is suggested in explaining the spontaneous regression mechanism in recent years, although the spontaneous regression percentages are low, the other views may be in question when explaining spontaneous regression is seen in especially subligamentous discs.

As well as this phenomenon is known well, it is not really known on which patients the spontaneous regression can be seen. Studies regarding the identification of positive prognostic factors in literature shows limited informations to the clinician. On the other hand, positive prognostic factors are suggested such as the possibility of spontaneous regression in sequesterant and extrude discs compared to protrusive discs are higher [14] and discussing the ligament rupture which can be shown in MR and the parietal contrast of the disc part which can be shown in MR [17,18]. Seeing spontaneous regression at any level free from the spinal level draws attention.

In lumbar disc disease, the reason of the pain is not only explained with mechanical root compression, the continuous inflammation and oedema of the root are also known to be effective in pain [19]. It is reported that the inflammatory substances such as Phospholipase A2 [20,21,19]. NO [22], metalloproteinase [22], prostaglandin E2 [24] and interleukin-6 [25] also play a role in radiculopathy. Kawakami and his friends have stated that the nucleus pulposus itself takes place in radiculopathy mechanism affected either chemical or mechanical compression [20,21].

Case 1 presented in this article, is in sequesterant disc type and is thought to be suitable with the 3rd view that explains the spontaneous regression suggested in literature. The decline of patient complaints are supposed to start after the spontaneous regression in the disc. The second case presented is subligamentous disc, although the spontaneous regression shown radiologically has happened, the reason of the continuous pain of the patient shows that the radiculopathy continues because of the existing inflammation. It is discussed that the spontaneous regression that is shown radiologically cannot be explained with the 3rd mechanism placed in literature.

CONCLUSION

Most of the cases that take place in case reports in literature, is the cases that conclude in spontaneous regression after the clinicians offer surgical treatment but the patients choose the nonsurgical treatment they would like to have. Also in the cases we presented, the patients have chosen the nonsurgical treatments they would like to have. The new studies that will be carried out need to present the mechanism completely, identify the positive prognostic factors of spontaneous regression and establish a new algorithm in lumbar disc disease.

REFERENCES

1. Gibson JN, Grant IC, Waddell G; The Cochrane review of surgery for lumbar disc prolapse and degenerative lumbar spondylosis. Spine, 1999; 24(17): 1820–32.
2. Weinstein JN, Lurie JD, Tosteson TD; Surgical vs nonoperative treatment for lumbar disk herniation: the Spine Patient Outcomes Research Trial (SPORT) observational. Cohort JAMA, 2006; 296(20): 2451–2459.
3. Saal JA, Saal JS. The natural history of lumbar intervertebral disk extrusion treated nonoperatively. Spine, 1990; 15(7): 683–686.
4. Bozzao A, Gallucci M, Masciocchi C, Aprile I, Barile A, Passariello R; Lumbar disk herniation: MR imaging assessment of natural history in patient treated without surgery. Radiology, 1992; 185(1): 135–141.
5. Komori H, Shinomiya K, Nakai O, Yamaura I, Takeda S, Furuya K; The natural history of herniated nucleus pulposus with radiculopathy. Spine, 1996; 21(2): 225-229.
6. Takada E, Takahashi M, Shimada K; Natural history of lumbar disc hernia with radicular leg pain. Spontaneous MRI changes of the herniated mass and correlation with clinical otcome. J Orthop Surg(Hong Kong), 2001; 9(1): 1-7.
7. Jevtic V; Magnetic resonance imaging appearance of different discovertebral lesions. Europ Radiol, 2001; 11(7): 1123–1135.
8. Grenier N, Greselle JF, Vital JM, Kien P, Baulny D, Broussin J, et al; Normal and disrupted lumbar longitudinal ligaments: correlative MR and anatomic study. Radiology, 1989; 171(1): 197–205.
9. Saal JS, Franson RC, Dobrow R, Saal JA, White AH, Goldthwaite N; High levels of inflammatory phospholipase A2 activity in lumbar disc herniations. Spine, 1990; 15(7): 674–678.
10. Gezici AR, Ergün R; Spontaneous regression of a huge subligamentous extruded disc herniation: short report of an illustrative case. Acta Neurochir, 2009; 151(10): 1299–1300.
11. Karabekir HS, Yildizhan A, Balci C, Atar EK; Spontaneous regression of lumbar disc herniation. Neurosciences, 2007; 12(1): 76-78.
12. Sabuncuoğlu H, Ozdogan S, Timurkaynak E; Spontaneous Regression of Extruded Lumbar Disc

Herniation: Report of Two Illustrative Case and Review of the Literature. Turkish Neurosurgery, 2008; 18(4): 392-396.
13. Ahn SH, Ahn MW, Byun WM; Effect of the transligamentous extension of lumbar disc herniations on their regression and the clinical outcome of sciatica. Spine, 2000; 25(4): 475–480.
14. Splendiani A, Puglielli E, De Amicis R, Barile A, Massiocchi C, Gallucci M; Spontaneous resolution of lumbar disc herniation: predictive signs for prognostic evaluation. Neuroradiology, 2004; 46(11): 916–922.
15. Haro H, Shinomiya K, Murakami S, Spengler DM; Up-regulated expression of matrilysin and neutrophil collagenase in human herniated discs. J Spinal Disord, 1999; 12(3): 245-249.
16. Ito T, Yamada M, Ikuta F, Fukuda T, Hoshi SI, Kawaji Y, et al; Histologic evidence of absorption of sequestration-type herniated disc. Spine, 1996; 21(2): 230-234.
17. Komori H, Okawa A, Haro H, Muneta T, Yamamoto H, Shinomiya K; Contrast-enhanced magnetic resonance imaging in conservative management of lumbar disc herniation. Spine, 1998; 23(1): 67-73.
18. Yamashita K, Hiroshima K, Kurata A; Gadolinium-DTPA--enhanced magnetic resonance imaging of a sequestered lumbar intervertebral disc and its correlation with pathologic findings. Spine, 1994; 19(4): 479-482.
19. Saal JA, Saal JS; Nonoperative treatment of herniated lumbar disc with radiculopathy: an outcome study. Spine, 1989; 14(4): 431–436.
20. Kawakami M, Tamaki T, Hayashi N, Hashizume H, Nishi H; A possible mechanism of painful radiculopathy in lumbar disc herniation. Clin Orthop Relat Res, 1998; 351: 241–251.
21. Kawakami M, Tamaki T, Weinstein JN, Hashizume H, Nishi H, Meller S; Pathomechanism of pain-related behavior produced by allografts of intervertebral disc in the rat. Spine, 1996; 21(18): 2101–2107.
22. Ashizume H, Kawakami M, Tamaki T, Nishi H; Histochemical demonstration of nitric oxide in herniated lumbar discs: A clinical and animal model study. Spine, 1997; 22(10): 1080–1084.
23. Schroeder M, Viezens L, Schaefer C, Friedrichs B, Algenstaedt P, Rüther W, et al; Chemokine profile of disc degeneration with acute or chronic pain. J Neurosurg Spine, 2013; 18(5): 496-503.
24. Miyamoto H, Saura R, Harada T, Doita M, Mizuno K; The role of cyclooxygenase-2 and inflammatory cytokines in pain induction of herniated lumbar intervertebral disc. Kobe J Med Sci, 2000; 46(1-2): 13-28.
25. Ohtori S, Suzuki M, Koshi T, Takaso M, Yamashita M, Inoue G; Proinflammatory cytokines in the cerebrospinal fluid of patients with lumbar radiculopathy. Eur Spine J, 2011; 20(6): 942-946.