Academic Journal of Neurology & Neurosurgery

Case Report

DOI: 10.51271/AJNN-0035

# Spontaneously resorbed lumbar disc herniation: two case reports

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Received: 16/06/2025 • Accepted: 28/09/2025 • Published: 30/09/2025

Cite this article: Yüksel U, Özdemir A, Aydın Ö. Spontaneously resorbed lumbar disc herniation: two case reports. *Acad J Neurol Neurosurg.* 2025;2(3):62-65.

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## ABSTRACT

It has been reported that patients with lumbar disc herniation, particularly those without severe symptoms, may benefit from conservative treatment, and spontaneous resorption of the herniated disc can occur in the natural course of some cases of lumbar disc herniation. In this study, two patients with intervertebral disc herniation were discussed: one with a right lateral recess at the lumbar 3-4 level, causing compression of the right lumbar 4 nerve root, and the other with a left lateral recess at the lumbar 2-3 level, causing compression of the left lumbar 3 nerve root. Both patients exhibited no significant neurologic or functional deficits, except for radicular pain. Magnetic resonance images of both patients revealed that the herniated disc material had migrated within the spinal canal, and the T2 signal intensity was increased; therefore, these herniated discs were considered to be soft. Both patients underwent conservative treatment. Follow-up magnetic resonance images showed the complete disappearance of the herniated disc material at five months for one patient and at nine months for the other. In conclusion, conservative treatment methods should be preferred for lumbar disc herniation patients without severe symptoms. Furthermore, the herniated disc material may undergo resorption and even completely disappear with close follow-up of this patient group.

**Keywords**: Lumbar disk herniation, spontaneous disk resorption, extrusion, magnetic resonance imaging

## INTRODUCTION

Deciding whether to perform surgery for lumbar disc herniation (LDH) and selecting the appropriate procedure depends on the severity of the symptoms and the relationship between the clinical, physio-pathological, and radiological findings. However, the choice of treatment also takes into account the patient's and/or the surgeon's preferences.[1]

In the literature, the presence of disc extrusion, "cauda equina" syndrome, severe motor deficits/disabilities, and persistent pain is reported as absolute indications for surgical intervention. Although surgical intervention has advantages such as rapid symptom relief, increased stability, facilitated bone healing, and restoration of alignment, several randomized controlled trials have shown that the clinical findings between conservative and surgical treatment in LDH patients with radiculopathy were similar one year after diagnosis.[1] Some patients with LDH, particularly those without severe symptoms, may benefit from conservative treatment. Some of the patient's clinical symptoms will soon subside or completely resolve. In fact, given that spontaneous resorption of herniated discs is often present in the natural history of some LDH, symptoms will resolve spontaneously in some patients.[2] In the literature, there is no optimal treatment scheme for massive LDH, which is only associated with pain, and clear indications for surgical treatment have not been established yet.

This study discussed two patients with LDH who underwent conservative treatment and experienced rapid, spontaneous disc resorption by the end of the treatment period.

## CASE 1

A 57-year-old man was admitted to the neurosurgery outpatient clinic complaining of pain in his right leg. He had pain in his right buttock that radiated to the front of his thigh. His neurogenic claudication threshold was 500 meters, and he had no urinary or fecal incontinence. On examination, there was no motor deficit, the right Lasègue's sign was positive, and the Faber and Fadir tests were negative. The patient had hypoesthesia in and below the dermatome from which he experienced pain. Deep tendon reflexes were normal. Lumbar T2-weighted magnetic resonance (MR) imaging showed an extruded, downward-migrated disc herniation at the lumbar (L) L3-4 level. This was located in the right lateral recess and was compressing the right L4 nerve root (Figure 1). Surgery

was not considered as the patient had no motor deficit and the herniated disc fragment appeared as an edematous soft disc on MR images.

**Figure 1.** Lumbar T2-weighted MR imaging of a 57-year-old man showed an extruded and downward-migrated disc herniation at the L3-4 level, which was located in the right lateral recess and compressed the right L4 nerve root (indicated with a white arrow).

The patient attended a follow-up appointment two months later. His symptoms were ongoing. Repeated examination revealed no motor deficit; however, the Lasègue sign remained positive, and hypoesthesia persisted. Lumbar MR scan showed that the shape and location of the disc fragment had not changed (Figure 2A). Because MR images with gadolinium, which were used to differentiate between a possible facet or ligamentum flavum cyst and other masses, revealed an extruded soft disc herniation with dense edema, conservative treatment was continued.

When the patient attended a follow-up appointment five months later, it was established that his symptoms and hypoesthesia had improved. Neurological examination revealed complete muscle strength and a negative Lasègue's sign. Control lumbar MR scan with gadolinium showed that the disc fragment had completely disappeared and that the right nerve root had been relieved (Figure 2B).

## CASE 2

A 42-year-old man attended the neurosurgery outpatient clinic complaining of worsening low back pain over the previous two weeks. The pain radiated from his lower back down through his left buttock and into his left toe. His neurogenic claudication threshold was 500 meters. There was no urinary or fecal incontinence. Lasègue's sign was negative, and the left Faber test was positive. The muscle strength evaluation revealed that left hip flexion and extension were 4+/5, and left foot dorsiflexion was 4+/5. The patient's lumbar MR images revealed an extruded and upward-migrated disc herniation at the L2–L3 level. This was located in the left lateral recess, severely compressing the left L3 nerve root. The herniated part was soft and swollen (Figure 3A). Surgery was not considered initially because the patient did not have severe motor deficits and had a soft herniated disc with dense oedema.

Ten months later, at the follow-up appointment, it was found that the patient's symptoms had improved significantly. Neurological examination revealed complete muscle strength, normoactive deep tendon reflexes, and negative Lasègue's, Faber's, and Fadir's tests. The patient had no urinary or fecal incontinence. Control lumbar MR images showed that the herniated disc had disappeared completely and that the left nerve root was free through its neural foramen (Figure 3B).

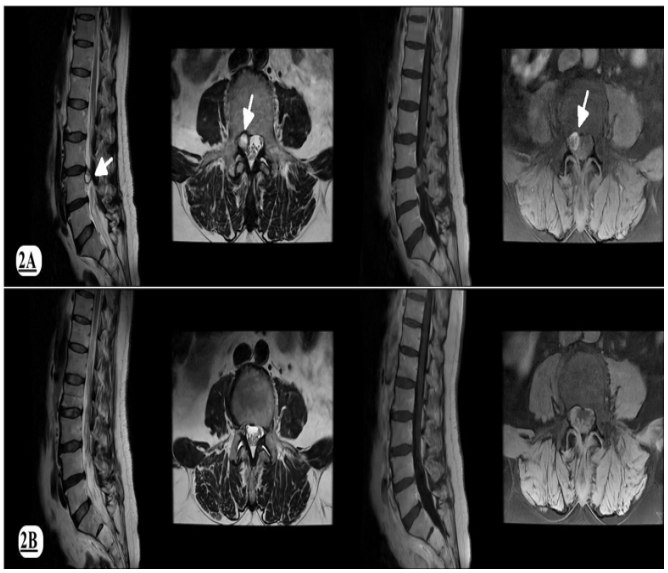


**Figure 2.** Lumbar MR images of a 57-year-old man scanned at a follow-up visit two months later showed the same shape and the location of the soft disc fragment with dense edema. MR images with gadolinium revealed that this extruded disc fragment showed high contrast enhancement (indicated with a white arrow) **(2A)**. T2-weighted MR and MR images with gadolinium checked five months later revealed that the disc fragment in the patient had completely disappeared, and the right root was relieved **(2B)**.

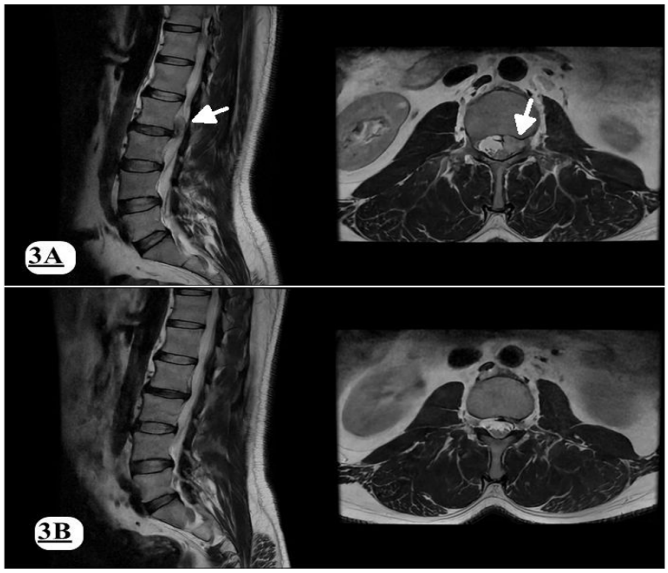


**Figure 3.** T2-weighted MR images of a 42-year-old man showed an extruded and upward migrated disc herniation at the L2-3 level, and it was located in the left lateral recess with severe compression of the left L3 nerve root. The herniated part was observed as soft and edematous (indicated with white arrow) **(3A)**. Control T2-weighted MR images of the patient examined nine months later showed that the herniated disc had disappeared completely, and the left nerve root was free throughout its foramen **(3B)**.

## DISCUSSION

The choice of treatment strategy for LDH should be based on the severity of the disease and the patient's general condition. Choosing the non-surgical or surgical treatment depends on the severity of symptoms and the clinicopathologic correlation. However, the decision on the treatment strategy is partly preference-sensitive, depending on the surgeon's preference, which is influenced by the physician's experience and patients' expectations.[3] On the other hand, the natural history of LDH is not fully understood, but it is well-known that herniated disc fragments can spontaneously resolve over time. Cribb et al.[4] reported that repeated MR scans performed on average 24 months later showed dramatic resolution of massive LDH in 14 out of 15 patients. In both of our patients, MR scans showed that the herniated disc was severely edematous in soft nature, but despite this, there was no significant neurological loss. Since the patients did not have severe neurologic loss and did not have pain or loss of function (such as drop foot, incontinence, neurologic claudication, or erectile dysfunction) that severely affected their quality of life, surgical treatment was not considered as a treatment option. Therefore, conservative treatment methods (such as using analgesics and muscle relaxants, absolute bed rest for at least one week followed by physiotherapy, weight loss, exercises including walking, and swimming) were preferred. Indeed, these conservative treatment method results showed that the patient's complaints were completely resolved within an average of one year, and there was no additional neurologic deterioration during this period.

Recently, Chiu et al.[5] reported that the predictive factors for spontaneous regression of herniated disc were extruded and sequestered herniation types, migrated disc, transligamentous herniation, herniation showing contrast enhancement, and high T2 signal intensity of the herniated disc on MR images. They also reported that the spontaneous regression rate was 96% for disc sequestration, 70% for disc extrusion, 41% for disc protrusion, and 13% for disc bulging. In another study, a decrease in disc size was observed in 7 of 8 patients with migrated discs, suggesting that migrated discs are a strong predictive factor for spontaneous regression of LDH.[6]

On the other hand, the literature suggests three potential hypotheses for the process of disc resorption: "retraction", "dehydration and shrinkage", and "inflammatory response and neovascularization". In particular, it has been argued that an inflammatory response and neovascularization lead to the gradual resorption of cartilage tissue through enzymatic degradation and phagocytosis. Intervertebral disc tissue possesses antigenic properties and is separated from the human immune system by the annulus fibrosus. When this tissue detaches from the annulus, it behaves like a foreign body, prompting an autoimmune reaction. Tumor necrosis factor-α is present in the area following disc herniation and triggers significant interleukin secretion. This can facilitate the absorption of herniated disc tissue by promoting aggregation of the macrophages. This process involves crucial apoptosis-related factor ligands that induce apoptosis and mediate inflammation. They induce apoptosis and mediate inflammation.[7] In this context, Kobayashi et al.[8] examined the intervertebral disc herniation tissue obtained from patients who underwent surgery for LDH, using light microscopy and electron microscopy. They found that new microvessels had penetrated the epidural space and emerged around the tissue of the intervertebral disc, causing localized inflammatory reactions and intense infiltration of macrophages.

Our patients had extruded and migrated discs, and these herniated discs exhibited high T2 signal intensity on MR images. Especially in the first case, the contrast-enhanced lumbar MR images revealed that the disc herniation persisted, the T2 signal intensity remained high, and the extruded disc showed intense contrast enhancement following the administration of gadolinium intravenously. We hypothesized that this intense contrast enhancement and high T2 signal intensity were secondary to neovascularization and inflammatory reactions against the extruded disc. For this reason, we concluded that the reason for the complete disappearance of the herniated discs in the MR images of both patients was not due to "retraction", "dehydration, and shrinkage", but rather a foreign body reaction (phagocytosis by macrophages migrating into the environment after neovascularization) against the herniated discs.

Autio et al.[9] reported that the 41–50 age group was associated with a higher resorption ratio of the herniated discs. The authors suggested that herniated discs in older patients are harder, more fibrotic, and drier than those in younger patients. They also found that the presence of less nucleus pulposus tissue and more annulus fibrosus and cartilaginous endplate material in herniated discs inhibits neovascularization around the disc. Conversely, Seo et al.[10] reported that the extent of LDH resorption was not associated with age, and the volumetric increase was higher in older patients than in younger patients. Our patients were aged 40-60 years. Additionally, MR images revealed high T2 signal intensity and significant contrast enhancement in the herniated disc tissue. Therefore, the intervertebral disc material in our patients was soft and, more importantly, edematous with increased vascularity. For this reason, it was thought that the water content of the intervertebral disc material may still be high in the young middle-aged patients. Furthermore, the absence or minimal neurological deficit in patients supported the idea that the disc material compressing the neural tissues may have a soft consistency.

## CONCLUSION

This study found that conservative treatment methods could be preferable for patients with LDH who do not experience severe symptoms such as persistent pain, "cauda equina" syndrome, or motor/functional loss. Furthermore, close monitoring of this patient group revealed that the herniated disc material may undergo resorption or even disappear completely. In conclusion, these observations suggest that conservative treatment options could achieve similar clinical results to surgery for this patient group, while avoiding the various early and late complications that surgery may cause.

## ETHICAL DECLARATIONS

### Informed Consent

All patients signed and free and informed consent form.

## Referee Evaluation Process

Externally peer-reviewed.

## Conflict of Interest Statement

The authors have no conflicts of interest to declare.

## Financial Disclosure

The authors declared that this study has received no financial support.

## Author Contributions

All authors declare that they have all participated in the design, execution, and analysis of the paper and that they have approved the final version.

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