

# EXPERIENCE OF RESORPTION OF LUMBAR SPINE HERNIAS

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## Annotation

**Background.** In most cases, the reduction in pain and clinical manifestations is associated with a decrease in the size of the hernia or its resorption, which is the natural process of reduction or complete disappearance of the hernia without the need for surgical intervention. Currently, there are several intensive physical therapy methods that influence the process of hernia resorption, making conservative treatment preferable.

**Materials and methods.** At the «Expert Neuro» clinic, as part of a prospective observational study from 2023 to 2024, 30 patients with a confirmed diagnosis of “herniated intervertebral discs of the lumbar spine” were analyzed based on the results of magnetic resonance imaging. The main group of patients received conservative treatment using modern high-intensity physiotherapy methods, the control group received classical methods of conservative treatment.

**Results.** According to magnetic resonance of the spine, 3 patients developed resorption of a herniated intervertebral disc. In all patients, radiculopathy symptoms improved after 1 month and lower back pain symptoms improved after 2 to 3 months.

**Conclusion.** According to our clinical experience and relevant literature, sequestered disc herniations have a high rate of resorption. Pathophysiological processes of inflammation and regeneration are the main mechanisms of this phenomenon. Conservative management of such patients in the absence of definitive surgical indications should not be underestimated.

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The authors declare no conflict  
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intervertebral discs, physiotherapy.

## Бел омыртқасының омыртқа-аралық диск грыжасын резорбциялау тәжірибесі

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## Мүдделер қақтығысы:

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## Түйінді сөздер:

резорбция, грыжа, омыртқааралық  
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### Түіндеме

**Өзектілігі.** Бел омыртқасының дискілерінің грыжалары (жарық) төменгі арқадағы ауырсынудың ең көп таралған себептерінің бірі болып табылады, көп жағдайда ауырсыну мен клиникалық көріністердің төмендеуі грыжаның кішіреюі мен резорбциясымен байланысты.

Грыжа резорбциясы-бұл хирургиялық емсіз грыжа мөлшерінің өздігімен мөлшерінің азаюы немесе толығымен жоюлу процесі. Бүгінгі күні грыжа резорбциясының патофизиологиялық процесіне әсер ететін бірқатар қарқынды физиотерапиялық әдістер бар, бұл консервативті емдеуді қолайлы етеді.

**Материалдар мен тәсілдер.** "Expert Neuro" клиникасының базасында перспективалық бақылау зерттеуінің аясында 2023-2024 жылдар аралығында магнитті-резонанстық томография нәтижелері бойынша "бел омыртқасының омыртқа-аралық диск грыжасы" диагнозы расталған 30 науқасқа талдау жасалды. Науқастардың негізгі тобы заманауи жоғары қарқынды физиотерапиялық әдістерді қолдана отырып, консервативті ем алды, ал бақылау тобы консервативті емдеудің классикалық әдістерін алды.

**Нәтиже.** Омыртқаның магнитті-резонанстық томография мәліметтері бойынша 3 науқаста грыжа дискінің резорбциясы дамыды. Барлық науқастарда радикулопатия белгілері 1 айдан кейін, ал төменгі арқадағы ауырсыну белгілері 2-3 айдан кейін төмендеді.

**Қорытынды.** біздің клиникалық тәжірибемізге және тиісті әдебиеттерге сәйкес секвестрленген диск грыжалары жоғары резорбцияға ие. Қабыну мен регенерацияның патофизиологиялық процестері бұл құбылыстың негізгі механизмдері болып табылады. Нақты хирургиялық көрсеткіштер болмаған жағдайда, мұндай науқастарды консервативті әдістерімен емдеу жолдарын қарастырған жөн.

## Опыт резорбции грыж поясничного отдела позвоночника

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## Аннотация

**Введение.** Грыжи поясничных дисков представляют собой одну из наиболее частых причин болей в пояснице, в большинстве случаев уменьшение боли и клинических проявлений связаны с уменьшением грыжи или ее резорбцией. Резорбция грыжи — это процесс естественного уменьшения размеров или полного исчезновения грыжи без хирургического вмешательства. Сегодня существуют ряд интенсивных физиотерапевтических методов влияющих на патофизиологический процесс резорбции грыжи, что делает консервативное лечение предпочтительным.

**Материалы и методы.** На базе клиники «ExpertNeuro» в рамках проспективного обсервационного исследования с 2023 по 2024 годы было проанализировано 30 больных с подтвержденными диагнозом «грыжа межпозвонковых дисков поясничного отдела позвоночника» по результатам магнитно-резонансной томографии. Основная группа пациентов получали консервативное лечение с применением современных высокоинтенсивных физиотерапевтических методов, контрольная группа получала классические методы консервативного лечения.

**Результаты.** По данным магнитно-резонансной томографии у 3 пациентов развилась резорбция грыжи межпозвонкового диска. У всех пациентов симптомы радикулопатии уменьшились через 1 месяц, а симптомы боли в пояснице — через 2-3 месяца.

**Заключение.** Согласно нашему клиническому опыту и соответствующей литературе, секвестрированные грыжи дисков имеют высокую степень резорбции. Патофизиологические процессы воспаления и регенерации являются основными механизмами этого явления. Не следует недооценивать консервативные методы лечения таких пациентов при отсутствии окончательных хирургических показаний.

## Introduction

According to foreign authors, the prevalence of general pain ranges from 30 to 78.6%. The definition of the International Association for the Study of Pain (IASP), «pain is an unpleasant sensory and emotional experience associated with existing or possible tissue damage or described in terms of such damage». <sup>1,2,3,4</sup> Lower back pain is the most common health problem among the population aged 30 to 65 years. <sup>5,6-8</sup>

Herniated lumbar discs are one of the most common causes of lower back pain, in most cases, pain reduction and clinical manifestations are associated with a decrease in herniation or its resorption. <sup>1,2,5,8</sup>

Thanks to the improvement in the quality of neuroimaging research methods, especially MRI, it has been demonstrated that with conservative treatment of this category of patients, as symptoms alleviate, a decrease in the size of the hernial protrusion is sometimes observed. This phenomenon has been called “resorption of intervertebral disc herniation.” According to a meta-analysis, the frequency of this phenomenon is 62.5–82.9%. <sup>8,9,6</sup>

The purpose of the study is to demonstrate the results in the use of

high-intensity physiotherapeutic methods of influencing the process of resorption of herniated intervertebral discs of the lumbar spine.

## Materials and methods

The cross sectional analysis of the observation study was conducted on the basis of the Expert Neuro clinic, 30 patients with confirmed diagnoses of «herniated discs» were analyzed and examined as part of a dissertation study from 2023 to 2024 according to the results of magnetic resonance imaging (MRI).

The sample size of 30 patients was calculated based on the number of patients among the adult population who came to our center over the past year with a diagnosis of lumbar intervertebral disc herniation. Accordingly, a sample size of adult patients was calculated (confidence level: 95%, margin of error: 5%). Patients were recruited from clinics in urban areas of Almaty with the support of local medical staff.

The control (I) group received 1-2 courses of treatment with classical methods of conservative treatment: nonsteroidal anti-inflammatory therapy (NSAIDs), B vitamins, electrophoresis, low-intensity magnetic therapy, acupuncture No. 10 doses 1 time per day.

The main (II) group of patients received 1-2 courses of treatment using: HIL therapy (high-intensity laser treatment), SIS therapy (High-intensity magnetotherapy), acupuncture No. 10 doses 1 time per day. Groups were formed by continuous sampling method.

The clinical and neurological status of patients, the assessment of the severity of pain syndrome using a visual analog scale (VAS), as well as the results of MRI (or CT) before the start of treatment and after 3 months were taken into account.

Inclusion criteria: patients aged 30 to 65 years, the presence of a clinical diagnosis of «herniated intervertebral discs in the lumbar spine» in accordance with ICD-10, confirmed by MRI (or CT) results, the duration of pain up to 6 weeks, the intensity of pain in the leg is at least 6 points on the visual analog scale, VAS.

Exclusion criteria: epilepsy, serious mental disorders, significant cognitive impairment, severe, uncontrolled somatic diseases, pregnancy or lactation, absolute indications for surgery; a history of herniated discs, participation in other clinical studies.

**Ethical approval.** This study was conducted in strict accordance with the

principles outlined in the Helsinki Declaration of the World Medical Association «Ethical Principles of medical research with human participation». Before commencing the research, approval was obtained from the Local Bioethics Committee of the Syzganov National Scientific centre of surgery (as amended in October 2013).

**Statistical Analysis**

Data were analyzed using IBM SPSS Statistics software version 17.0 (IBM SPSS, USA). Numerical variables were expressed as mean±SD and categorical variables as numbers and percentages. Nonparametric statistics were performed for dataset analysis. Between-group comparisons were assessed for numerical variables and the Chi-square test was used for categorical variables. P<0.05 was considered statistically significant.

**Results**

Participants in both groups underwent CT scanning of the lumbar spine. Spinal CT was performed in 1 (3.3%) patient in each of the groups. In the remaining 28 (93.4%) patients with lumbalgia, MRI of the lumbar spine was most widely used.

**Table 1.**  
Patients' characteristics in groups

	I group	II group	Chi-squared	P value
Patients	15(50.0%)	15 (50.0%)		
Male	8 (26.67%)	9 (30.0%)	0.021	0.883
Female	7 (23.33%)	6 (20.0%)	0.019	0.890
Statistically not significant difference P≥0.05				
Statistically significant difference P<0.05				

Before starting treatment, the characteristics of patients in group I were as follows: all 15 (100%) patients had lumbalgia, lumbar muscle defiance was detected in 4 (26.7%) patients, 5 (33.3%) patients had sharp pain when bending, and 9 (60.0%) patients were found to have soreness of spinous processes and paravertebral points. In 1 (6.7%) patient, lumbosacral syndrome was observed, with radiating pain in the lower limb, decreased or revived tendon reflexes, as well as with sensitive disorders.

In group II, before the start of treatment, the characteristics of patients looked somewhat different: all 15 (100%)

patients had pain in the lumbar spine, tenderness of spinous processes and paravertebral points. Lumbar muscle defiance was detected in 11 (73.3%) patients, in 8 (53.3%) patients, lumbosacral syndrome, radiating pain to the lower limb with a decrease or revival of tendon reflexes, as well as with sensitive disorders was detected. Sharp pain when bending only in 3 (20.0%) patients. Therefore, statistical difference was insignificant in both groups.

As a result of treatment of patients in both groups, regression of neurological symptoms was observed, but it was more pronounced in group II.

№	Symptoms and syndromes	Before treatment	After treatment			
			1 month	P value	3 months	P value
1	Sharp pain when bending over	15(50.0%)	10 (33.33%)	0.419	7 (23.33%)	0.248
2	Lower back muscle defense	4(13.33%)	2 (6.67%)	0.823	2 (6.67%)	0.823
3	Pain in the lumbar spine	5 (16.67%)	3 (10.0%)	0.807	2 (6.67%)	0.748
4	Pain in the spinous processes and paravertebral points	9 (30.0%)	4 (13.33%)	0.537	3 (10.0%)	0.507
5	Lumbosacral syndrome	1(3.33%)	-	-	-	-
6	Radiation of pain to the lower limb	1 (3.33%)	-	-	-	-
7	Decreased or increased tendon reflexes	1 (3.33%)	-	-	-	-
8	Sensory disorders	1(3.33%)	1 (3.33%)	1.000	-	-
Statistically not significant difference $P \geq 0.05$						
Statistically significant difference $P < 0.05$						

**Table 2.**  
Regression of clinical and neurological symptoms in group I

№	Symptoms and syndromes	Before treatment	After treatment			
			1 month	P value	3 months	P value
1	Sharp pain when bending over	3(10.0%)	1 (3.33%)	0.856	-	-
2	Lower back muscle defense	11 (36.67%)	7 (23.33%)	0.564	1 (3.33%)	0.519
3	Pain in the lumbar spine	15 (50.0%)	10 (33.33%)	0.419	1 (3.33%)	0.381
4	Pain in the spinous processes and paravertebral points	15 (50.0%)	10 (33.33%)	0.419	1 (3.33%)	0.381
5	Lumbosacral syndrome	8 (26.67%)	4 (13.33%)	0.616	-	-
6	Radiation of pain to the lower limb	8 (26.67%)	4 (13.33%)	0.616	-	-
7	Decreased or increased tendon reflexes	8 (26.67%)	4 (13.33%)	0.616	-	-
8	Sensory disorders	8 (26.67%)	4 (13.33%)	0.616	-	-
Statistically not significant difference $P \geq 0.05$						
Statistically significant difference $P < 0.05$						

**Table 3.**  
Regression of clinical and neurological symptoms in group II

We conditionally divided the visual analogue scale (VAS) as follows: • 0 no pain; • 1-2 mild pain; • 3-6 average pain; • 7-10 severe pain

VAS	0 no pain	1-2 mild pain	3-6 average pain	7-10 severe pain
I – group N 17	-	5	10	-
II – group N 13	-	-	12	3

**Table 4.**  
Results of the VAS questionnaire before treatment

**Table 5.**  
Results of the VAS questionnaire after treatment after 3 months

VAS	0 no pain	1-2 mild pain	3-6 average pain	7-10 severe pain
I – group N 15	1	13	1	-
II – group N 15	3	12	-	-

**Table 6.**  
Results of control MRI and CT images of the lumbar spine

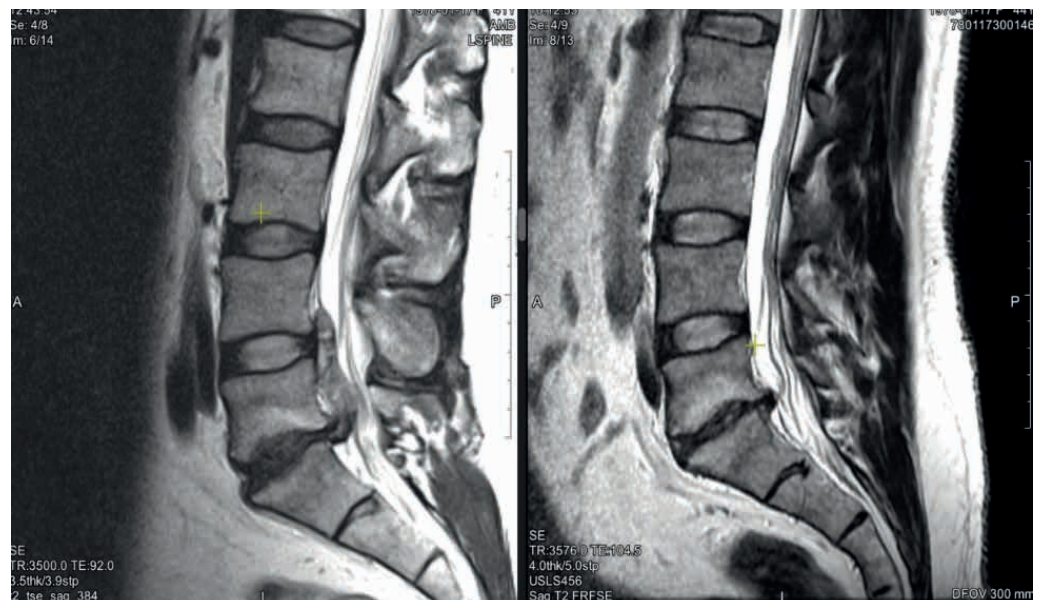
№	Before treatment	After 1 month	After 3 months	Before treatment
I – group N 15	Intervertebral disc herniation 15 (100%)	Transient reduction of hernia 5 (33.3%)	Persistent hernia reduction 6 (40%)	Resorption - no
II – group N 15	Intervertebral disc herniation 12 (80%) Sequestered hernia 3 (20%)	Transient reduction of hernia 1 (6.6%)	Persistent hernia reduction 12 (80%)	Resorption - 3 (20%)

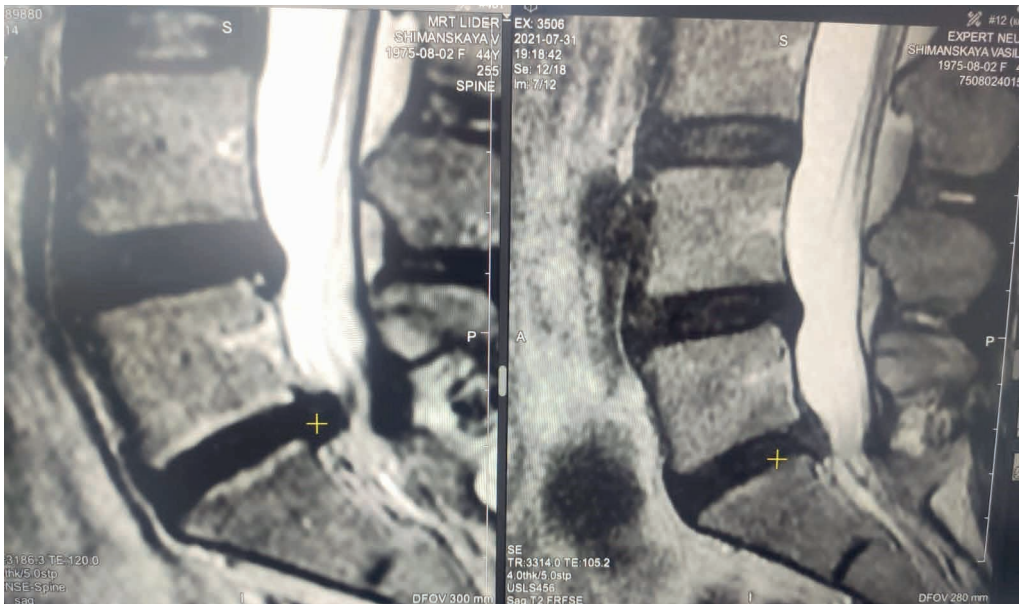
Based on the presented data, it can be concluded that the treatment of herniated discs can cause a temporary increase and change in the structure of the hernia, possibly due to an inflammatory reaction and infiltration of herniated tissue by immune cells. These changes can affect clinical manifestations and neurological symptoms. It is important to note that such changes

should not be considered solely as a negative trend, since in most cases they will be followed by a decrease in the size of the hernia and an improvement in clinical manifestations. Figure 1, 2, 3 shows MRI images of 3 patients before and after inclusion in the study, observed from 1 to 3 months, with spontaneous resorption of a herniated intervertebral disc.

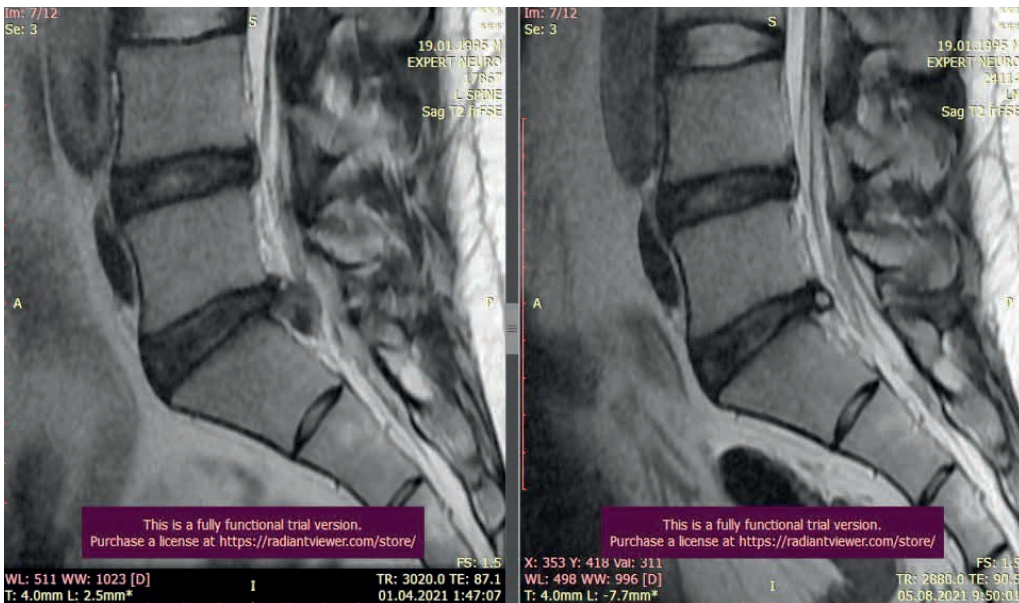
**Figure 1.**

A 39-year-old man, followed for 3 months, herniated L5-S1, there is a partial restoration of the MR signal and the height of the disc on the background of a decrease in herniation.





**Figure 2.** A 31-year-old man, followed for 3 months, herniated L5-S1, there is a partial restoration of the MR signal and the height of the disc on the background of a decrease in herniation.



**Figure 3.** A 45-year-old man, followed for 3 months, herniated L5-S1, there is a partial restoration of the MR signal and the height of the disc on the background of a decrease in herniation.

### Discussion

The phenomenon of lumbar disc herniation resorption following nonsurgical interventions has been extensively documented since its initial observation in 1984. These reports describe lumbar disc herniations diminishing or disappearing gradually over time. The non-surgical treatment cited in these reports encompass a range of approaches, including rest, lumbar support, pain relievers, oral steroids, non-steroidal anti-inflammatory drugs, epidural steroid injections, caudal epidural injections of local anesthetic, manipulation, heat therapy, ultrasound, electrotherapy, traction, exercises, Traditional Chinese Medicine, and integrative

Korean medicine. However, the specific treatments crucial for facilitating resorption and the timing of the resorption process remain uncertain.<sup>7,10,11</sup>

The North American Spine Society has suggested that the possibility of resorption should be considered when treating lumbar disc herniation. Although it is known that sequestered and large lumbar disc herniations have a greater likelihood of resorption, it is still impossible to accurately predict resorption in individual cases. Even the possibility of resorption cannot be predicted for individual cases.<sup>5,6,10</sup>

The frequency of resorption varies in different reports due to the varying

durations of observation. *Lee et al.*, documented the highest resorption rate at 96%, with an average observation period of  $341.38 \pm 306.83$  days. Conversely, two studies showed no resorption over shorter observation periods (45 days and 20 days), suggesting that resorption typically does not occur too quickly following nonsurgical interventions.<sup>12,13,14,15</sup>

Physical therapy can play an important role in helping the resorption of lumbar disc herniation. Although it is not possible to directly stimulate resorption using physiotherapy, the use of high-intensity physical influences in our case made it possible to do this.

#### Limitation.

The limitations were mainly associated with cases of breakdown of diagnostic equipment, lead to minor changes in control testing schedule. Also, all diagnostic studies were carried out only by the same doctor and equipment.

#### Conclusion

To date, there are many ways to treat herniated discs, but the levels of evidence of various methods create many questions, with the improvement of medical technology, planned therapeutic and diagnostic tactics lose their relevance in the 5-year period. Prognostic criteria have not yet been identified for the phenomenon of hernia resorption, which is important for choosing treatment tactics for patients with this pathology. In addition, the stages of resorption are not entirely obvious. Further research in this area is needed to identify imaging markers and more accurately allocate patients at the outpatient stage to choose conservative or surgical treatment.

#### What is already known on this topic:

A factor in the spontaneous resorption of a disc herniation is neovascularization. Physiotherapy can achieve a similar effect.

**What this study adds:** High-intensity physiotherapeutic methods at the stage of sequestration of a herniated disc are a promising treatment model for accelerating the resorption of the hernia. Control point of the study reducing the intake of anti-inflammatory drugs.

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