Research Article ISSN 2639-944X

Journal of Medical - Clinical Research & Reviews

Effective Conservative Treatments for Lumbar Disc Herniation: A Study on Short-Term Reabsorption Through Rehabilitation Techniques

Mohammad Kamali Kakhki*

Tehran Healthcare Clinic, Tehran, Iran.

***Correspondence:**
Mohammad Kamali Kakhki, Tehran Healthcare Clinic, Tehran, Iran.

Received: 30 Jul 2025; **Accepted:** 01 Sep 2025; **Published:** 12 Sep 2025

Citation: Mohammad Kamali Kakhki. Effective Conservative Treatments for Lumbar Disc Herniation: A Study on Short-Term Reabsorption Through Rehabilitation Techniques. J Med - Clin Res & Rev. 2025; 9(9): 1-6.

ABSTRACT

Background: *The prevalence of lumbar disc herniation (LDH) is on the rise among elderly individuals, significantly affecting their quality of life. Changes in lifestyle have also led to an increase in LDH cases among younger individuals, underscoring the importance of accurate diagnosis and targeted treatments. In some cases, spontaneous hernia regression can occur without the need for surgical intervention.*

Purpose: *The aim of this study was to document the short term reabsorption of intervertebral disc (IVD) using combination of conservative rehabilitation at Tehran Healthcare Clinic.*

Methods: *In this clinical study, the effectiveness of a specific therapy for LDH was assessed in 112 patients through MRI scans and Oswestry Disability Index (ODI) evaluations. The treatments administered included mechanical vibration therapy, radiofrequency therapy, and dietary recommendations.*

Results: *Out of the 136 patients, 112 received treatment and underwent specific therapy protocols consisting of 6-12 sessions, leading to the reabsorption of disc herniation in the majority of cases. The study demonstrated a success rate of 77.9% in improving the patients' conditions by MRI, accompanied by significant reductions in ODI scores. Statistical analyses confirmed the efficacy of the treatment approach.*

Conclusion: *We strongly recommend considering a combination of conservative rehabilitation especially mechanical vibration for the treatment of LDH, irrespective of the size of disc herniation.*

Keywords

Rehabilitation, Lumbar disc herniation, Mechanical vibration therapy, Oswestry Disability Index, Conservative methods, Reabsorption.

Introduction

Some diseases are on the rise in physiotherapy and rehabilitation among elderly people, such as lumbar disc herniation (LDH), which impacts the patients' quality of life, though they are not life-threatening [1]. LDH occurs when the fibrous annulus of the intervertebral disc ruptures, causing the nucleus pulposus to herniate and compress the spinal nerve and cauda equina, triggering an inflammatory reaction [2]. This condition presents clinical symptoms like low back pain, radicular leg pain, and neurological dysfunction. Changes in lifestyle and work habits have contributed to a rise in LDH cases among younger individuals, posing a threat to both physical and mental health. Therefore, accurate diagnosis and targeted treatments are crucial in managing this condition effectively.

Diagnosing LDH typically involves radiographic examinations, computed tomography (CT), and magnetic resonance imaging (MRI). Currently, MRI stands out as the most effective imaging method for diagnosing disc herniation. There are various

methods of therapy for herniated discs that demonstrate a range of effectiveness, including conservative treatment and surgery. Conservative treatment is divided into two categories [3]: 1) Drug treatments such as Analgesics, Antidepressants, Corticosteroid injections, Cytokine inhibitors, and Muscle relaxants 2) Spinal manipulation, acupuncture, advice to stay active, exercise therapy, heat, ice, massage, bed rest, and traction. Conservative care is usually the initial choice for the most newly diagnosed herniated intervertebral discs (IVD) for at least 6 weeks. Surgical interventions for treatment of LDH are considered as the second option including chemonucleolysis (CN), micro-endoscopic discectomy (MED), automated percutaneous lumbar discectomy (APLD), open discectomy (OD), microdiscectomy (MD), percutaneous laser disc decompression (PLDD), percutaneous endoscopic lumbar discectomy (PELD), and tubular discectomy (TD) [4].

To prevent nerve function defects and cauda equina syndrome, close monitoring of patients is essential during conservative treatment. If the following situations arise, immediate surgical intervention is necessary: lack of significant symptom relief after 6 months of conservative treatment, worsening of symptoms due to conservative measures, and the presence of clinical signs of cauda equina syndrome.

Based on severity, MRI imaging classifies the morphology of LDH into four stages, including bulging, protrusion, extrusion, and sequestration [5]. However, a disc can remain at one of the earlier stages or progress through all four. Sequestration represents the most severe form of LDH, often leading to typical radicular symptoms and potential spinal cord compression due to intense mechanical pressure and inflammatory irritation to the dural sac and nerve roots [5]. Therefore, evaluation for LDH treatment considerations encompasses the type of disc herniation, protrusion size and MRI signal enhancement surrounding the protrusion which can be observed on CT or MRI scans.

If patients experience a significant reduction in clinical symptoms (e.g., pain and numbness of lower limbs) and shrinkage or disappearance of an IVD without surgical intervention through MRI or CT scan, this is known as spontaneous hernia regression or reabsorption, which could be complete or partial [5].

The exact mechanisms of herniated disc regression remain unknown. However, three mechanistic hypotheses have been proposed including retraction of the protrusion within the annulus fibrosus, dehydration and contraction of the herniated nucleus pulposus leading to retraction, and the entrance of herniated disc fragments into the epidural space triggering an autoimmune response involving inflammatory reactions and neovascularization [1]. It is possible that one specific mechanism or a combination of different factors may play a role in the spontaneous reabsorption of disc herniation, depending on several clinical factors.

The aim of the study was to report the short term reabsorptions of IVD among different types of herniated lumbar intervertebral discs using a combination of conservative approaches at Tehran Healthcare Clinic.

Material and Methods

From January 2023 to September 2024, 136 patients with lumbar herniated disc, experiencing back pain, leg numbness and weakness, as well as bladder or bowel dysfunction, were referred to Tehran Healthcare Clinic. Initially, the patients underwent a CT or MRI scan to assess the type and number of LDH. Additionally, the patients completed the Oswestry Disability Index (ODI) form to evaluate functional outcomes related to low back pain. This questionnaire is used to evaluate the patient's permanent functional disability and has been considered as 'the gold standard' in low back pain functional outcome tools since 1980 [6].

Following the clinical and MRI assessments, our clinic administered conservative treatments, including mechanical vibration, Radio Frequency (RF) therapy, and dietary recommendations. All patients were informed of these routine conservative methods and provided their consent. Based on the imaging results, which identified the type and number of IVD issues ranging from bulging to sequestration, a treatment plan consisting of 6 to 12 sessions was determined for each patient. After completing the treatment course, a follow-up MRI and ODI form were conducted to compare with the initial assessments.

Mechanic Vibration

Mechanic vibration, specifically special vibration therapy (SVT), has been utilized as an effective treatment for lumbar disc herniation at our clinic [7]. By targeting the herniated disc fragment, SVT helps alleviate pain, enhance mobility, and facilitate healing for patients with this condition. This therapy aids in improving blood flow and delivering nutrients to the affected area, thereby supporting the healing process. SVT can significantly impact spontaneous regression, correct spinal alignment, and target damaged areas in the neural foramina and spinal canal affected by herniated discs. Depending on the patient's response, SVT sessions were scheduled once a week for a duration of 6 to 12 sessions.

Radio Frequency

Radiofrequency therapy is believed to stimulate angiogenesis—the formation of new blood vessels—and facilitate tendon fiber regeneration. Evidence suggests a more significant reduction in pain scores associated with radiofrequency treatment [8]. This therapy involves delivering an electric current via electrodes inserted between the vertebrae discs using an endoscope, effectively reducing localized pain.

Additionally, RF therapy enhances cellular metabolism and protein absorption by altering cellular polarity, leading to an increase in protein uptake within the disc materials and promoting spontaneous regression. Radiofrequency sessions were conducted once a week following SVT, ranging from 6 to 12 sessions based on individual therapy responses.

Diet

The consumption of water, vitamins, and collagen Type II protein can significantly impact the treatment of lumbar disc herniation. Water plays a vital role in maintaining hydration and overall bodily function, crucial for the health of intervertebral discs. Proper hydration helps uphold the structural integrity and flexibility of the discs, reducing the likelihood of disc herniation and aiding in the recovery process.

Essential vitamins, especially those supporting bone and connective tissue health like vitamin C and vitamin D, are vital for the upkeep and restoration of intervertebral discs. Vitamin C is crucial for collagen synthesis, a fundamental component of disc structure, while vitamin D assists in calcium absorption and bone strength, indirectly benefiting spinal disc health.

Collagen Type II protein, a key element of intervertebral disc cartilage, can potentially aid in regenerating and repairing damaged disc tissue. Research has shown that collagen type II supplementation may enhance disc structure and reduce inflammation in affected areas, contributing to the treatment of lumbar disc herniation [9]. Recommending a diet rich in water, vitamins, and collagen type II protein can complement traditional treatment methods for lumbar disc herniation and support overall disc health and healing.

Statistical Analyses

The statistical analyses in this study were conducted using IBM SPSS Statistics 27.0 (NY, USA). In all analyses, statistical significance was set at $P<0.05$. Normality was assessed using the Kolmogorov-Smirnov test, while Levene's test was employed to evaluate homogeneity. The paired t-test was utilized to assess repeated variable across measured times and estimate the effect size.

Results

The initial MRI scans and ODI results of the patients were evaluated. 112 out of 136 patients were admitted to our clinic. The remaining 24 patients were not admitted due to having a specific type of LDH (sequestration) that necessitated alternative methods like surgical techniques for treatment.

The majority of the patients were male (66.1%) with extrusion disc (43%) and over the age of 40 (54.5%). Among the 112 patients, 69 patients (61.6%) had two LDHs, while the rest had only one herniated disc. The most common locations for herniation were L5-S1 (46.4%) and L4-5 (35.9%), as shown in Table 1.

Following the second MRI scan and comparison with the initial one, spontaneous reabsorption of disc herniation was observed during 6 to 12 sessions, as illustrated in Figures 1 and 2. The progression of lumbar disc regression was evident, transitioning from protrusion and extrusion to a bulging form in the majority of cases. The second MRI results confirmed the effectiveness of the treatment, with a 77.9% success rate (complete and partial reabsorption) among patients.

Table 1: Baseline demographic characteristics.

Characteristic	Categories	No. (%)
Sex	Men	74 (66.1)
	Women	38 (33.9)
Age	<30	15 (13.4)
	30-40	36 (32.1)
	>40	61 (54.5)
Herniation Number	1	43 (38.4)
	2	69 (61.6)
Herniation level	L2-3/L3-4	32 (17.7)
	L4-5	65 (35.9)
	L5-S1	84 (46.4)
Herniation type	Bulge	38 (21)
	Protrusion	65 (36)
	Extrusion	78 (43)

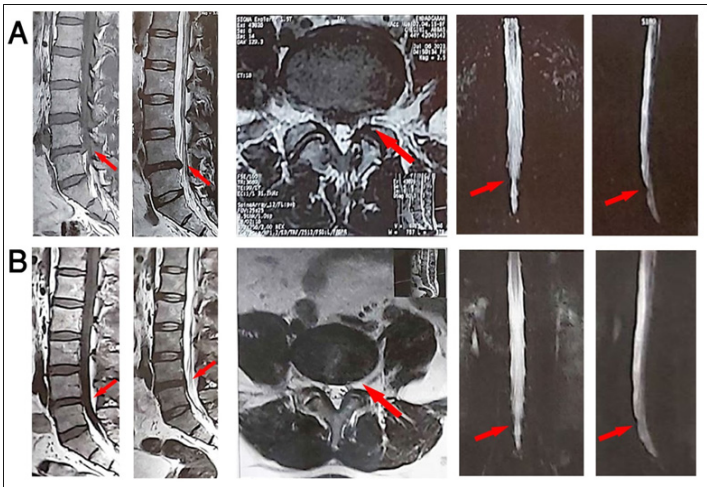

Figure 1: Image from a 45-year-old male patient with L4/L5 intervertebral disc. ***A***: The first MRI revealed a LDH, with the center of the herniation pushing the dural sac, resulting in compression of the nerve root and asymmetric deformation of the dural sac. ***B***: Following 12 sessions of conservative treatment, there was a notable reduction in disc herniation, absorption of the protrusion, and no significant compression or deformation of the dural sac.

The highest rate of regression was observed in cases of extrusion disc, with a significant 92.3% exhibiting regression. Among the 65 protrusion discs analyzed, 53 (81.5%) were absorbed as a result of treatment. In contrast, bulge discs displayed a lower response rate of only 42.1% to conservative methods. More details were shown in Table 2.

These findings emphasize the positive impact of the treatment protocol on disc herniation and stress the significance of regular monitoring and assessment to accurately track patient progress.

The comparison between Pre- and Pro-ODI scores provides insight into the treatment effect on disability levels (Figure 3.). Pre-ODI shows that the majority of patients had severe (33.9%) to completely disabled (25.9%) categories, with a smaller percentage in the mild (16.1%) disability levels. Post-treatment data indicates

a significant improvement in disability levels, with the majority of patients now falling into the no disability (50.9%) and mild disability (25.9%) categories. The percentages for moderate, severe, and completely disabled categories have all decreased in post-treatment. This comparison suggests that the treatment was effective in reducing disability levels among the patients during 3 months. The shift towards lower levels of disability in the Pro-ODI indicates an improvement in functionality and quality of life following the intervention. However, 21 patients (18.7%) with different ODI disability did not show any improvement in the level of disability despite the treatment provided.

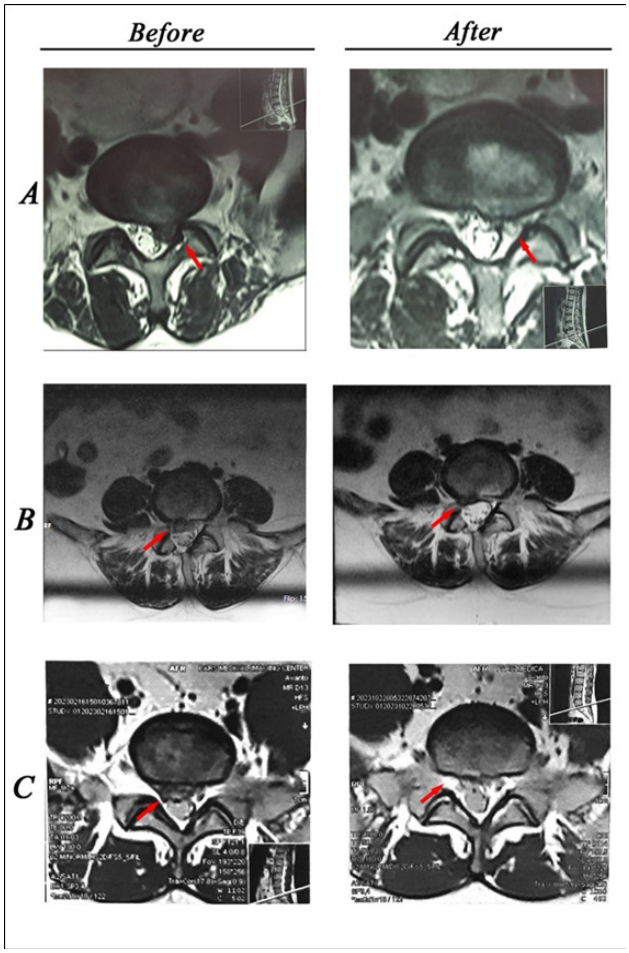

Figure 2: Before: The initial MRI in three cases (A, B and C) showed that the intervertebral discs were hugely herniated. **After**: The second MRI illustrated that the conservative treatment was successful, the discs herniation were significantly reduced and the protrusions were absorbed.

Table 2: Percentage of disc regression of lumbar disc herniation.

Classification	Regression (n)	No change (n)	Percentage of regression (%)
Bulge	16	22	42.1%
Protrusion	53	12	81.5%
Extrusion	72	6	92.3%

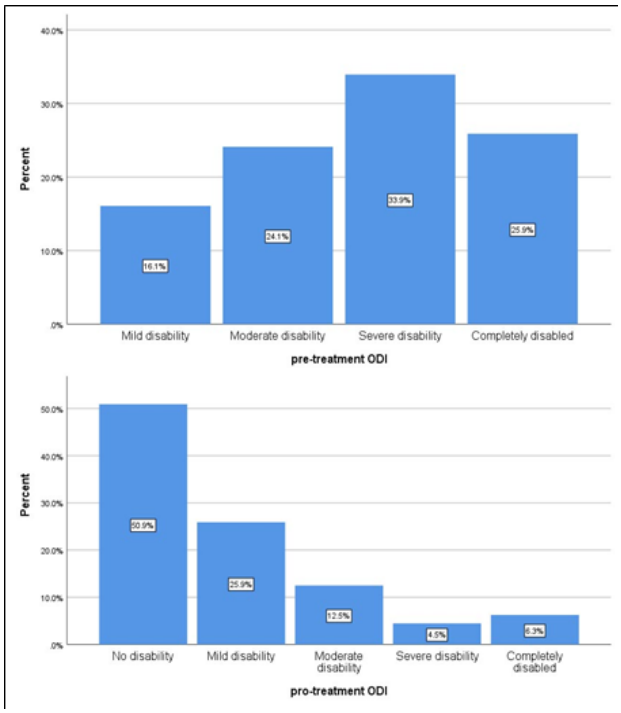

Figure 3: Proportion of patients with different disability level. **A**: The outcome of Pre-ODI, **B**: The outcome of Pro-ODI. Score Disability Level: 0 - 4 No disability, 5 - 14 Mild disability, 15 - 24 Moderate disability, 25 - 34 Severe disability, 35 - 50 Completely disabled.

Statistical analysis revealed significant differences in the ODI scores when comparing pre- and post-treatment results ($P<0.05$) (Table 3). The Pairwise Comparisons analysis confirmed statistical variances across 2 measured time points of ODI outcomes ($P<0.05$). Importantly, after 6-12 weeks of treatment sessions, a large effect size was observed for the ODI scale ($d=1.356$), indicating a substantial impact of the conservative treatment approach on patient outcomes. Additionally, the Pearson correlation coefficient of 0.690 showed a positive correlation, underscoring the effectiveness of the treatment in enhancing patients' conditions (Table 3). These statistical findings offer compelling evidence supporting the efficacy of the conservative approach in managing

Table 3: The statistical analysis of ODI in 112 patients.

	Mean (SD)								
	Pre	**Pro**	**Difference**	**95% CI**	**T**	**df**	**p***	**Correlation#**	**d**
ODI	26.11 (±8.979)	13.77 (±12.560)	12.339 (±9.097)	(10.636-14.043)	14.356	111	<.001	0.690	1.356

t test is used for analyzing the difference of means between groups.

* The mean difference is significant at the .05 level, SD: standard deviation.

The correlation (Pearson) with -1 indicating a perfect negative correlation, +1 indicating a perfect positive correlation, and 0 indicating no correlation at all.

d: Effect size (Cohen's d); d <0.2 small, 0.5 medium, d >0.8 large.

lumbar disc herniation and reducing disability levels among patients.

Discussion

Currently, disc herniation represents the most prevalent diagnosis associated with degenerative conditions of the lumbar spine and serves as the primary reason for spinal surgical procedures. The combination of conservative approaches has demonstrated the effectiveness of the procedure in reabsorbing disc herniation. Our findings indicate that an average of 10 sessions of SVT and RF, coupled with a diet program, could be effective in improving symptom severity and functional status in patients with LDH.

The initial documentation of spontaneous absorption of LDH without surgery in 1984 marked a significant breakthrough in non-surgical treatment research [10]. In 1990, 11 patients diagnosed with LDH through CT scans underwent conservative therapy, leading to varying degrees of protrusion absorption in subsequent MRI follow-ups: 0–50% in 2 patients, 50–75% in 4 patients, and 75–100% in 5 patients [11].

In our investigation, conservative therapy led to the resorption of lumbar herniated discs. Our patients underwent screening with a second MRI and completed the ODI form. Regrettably, some patients did not provide the second MRI after experiencing symptom improvement. Nevertheless, a comparison of the two ODI scores indicated potential absorption of LDH. Some studies have shown that while there is generally a weak correlation between disc regression and clinical outcomes, a reduction in disc size of more than 70% demonstrated a stronger link between disc regression and clinical outcome [12,13]. So, in situations where a reduction in ODI scores occurred without undergoing a follow-up MRI, we categorized this outcome as indicative of partial or complete reabsorption of the disc.

According to the second MRI results from 84 out of 112 patients, 28 patients showed 50–75% LDH reabsorption, while 42 patients showed 75–100% reabsorption. No evidence of reabsorption was found in 14 patients, totaling 77.9% of LDH reabsorption recorded via MRI screening. Referring to a meta-analysis based on 38 clinical studies, a typical rate of symptomatic LDH reabsorption was reported at 62–66% over the past three decades [14]. Another study indicated that out of 409 LDH patients, 320 individuals underwent conservative treatment, with 189 patients experiencing protrusion reabsorption, representing 59.06% of the total cases [15].

In our study, the highest absorption was observed in the largest LDH (92.3%), while the smallest herniated discs exhibited the lowest rates of reabsorption (42.1%). This observation aligns with the results obtained by Saal et al., confirming the consistency and validity of the findings across different studies [11]. In a previous investigation, 361 instances of lumbar herniated discs were examined to assess the likelihood of regression [14]. The sample comprised 60 bulging discs, 93 protruded discs, 154 extruded discs, and 54 sequestrated discs. The findings indicated varying rates of decrease in size over time: 96% for sequestrated discs, 70% for extruded discs, 41% for protruded discs, and 13% for bulging discs, demonstrating a significant association between herniation morphology classification and regression rate.

While some studies indicated that disc sequestrations were more likely to regress earlier compared to disc extrusions or protrusions [1,12], we did not admit 24 patients with sequestration LDH into our clinic, because we assumed that mechanical vibration could potentially be harmful for this type of LDH, opting instead for other conservative methods or surgery.

The effectiveness of the treatment was also evaluated using the ODI form. While the Pre-ODI data indicated moderate to severe disability levels in the majority of patients, with a smaller percentage in the mild disabled categories, the Pro-ODI data evidenced a notable shift towards lower disability levels, with a higher percentage of patients falling into the no disability and mild disability categories. This shift suggests that the treatment was effective in reducing disability levels among the patients, as indicated by strong positive correlation revealed through statistical analysis.

In this study, a combination of conservative methods demonstrated optimistic results in treating patients within three months. Mechanical vibration has shown promise in reducing treatment time for LDH patients. Some studies suggest that mechanical vibration therapy, including techniques like whole-body vibration or vibration massage, could offer significant advantages in alleviating pain, enhancing functionality, and improving quality of life for individuals suffering from LDH [16,17]. Our findings underscore the substantial impact of specific mechanical vibrations, such as SVT, on managing herniated discs.

In conclusion, integrating SVT into treatment protocols alongside RF and dietary modifications is recommended for optimal outcomes in LDH patients, regardless of disc herniation size. However, caution is advised when treating patients with sequestration LDH, as other conservative methods or surgery may be more suitable in such cases.

The current study had some limitations: short follow-up time and missing the second MRI scans in some cases. Moreover, the mechanism of reabsorption was not investigated in this study.

References

1. Yu P, Mao F, Chen J, et al. Characteristics and mechanisms of resorption in lumbar disc herniation. Arthritis Research & Therapy. 2022; 24: 205.
2. Olmarker K, Blomquist J, Strömberg J, et al. Inflammatogenic properties of nucleus pulposus. Spine. 1995; 20: 665-669.
3. Jordan JL, Konstantinou K, O'Dowd J. Herniated lumbar disc. BMJ clinical evidence. 2011.

4. Wei FL, Li T, Gao QY, et al. Eight surgical interventions for lumbar disc herniation a network meta-analysis on complications. Front Surg. 2021; 8: 679142.
5. Cunha C, Silva AJ, Pereira P, et al. The inflammatory response in the regression of lumbar disc herniation. Arthritis Res Ther. 2018; 20: 1-9.
6. Fairbank JC, Pynsent PB. The Oswestry disability index. Spine. 2000; 25: 2940-2953.
7. Kakhki MK, Kakhki RK. Treatment of Kienbock's Disease by an Experimental Conservative Approach Case Report. Med Clin Res. 2023; 8: 1.
8. Marliana A, Setyopranoto I, Setyaningsih I, et al. The effect of pulsed radiofrequency on radicular pain in lumbal herniated nucleus pulposus a systematic review and meta-analysis. Anesth Pain Med. 2021; 11.
9. Lian C, Gao B, Wu Z, et al. Collagen type II is downregulated in the degenerative nucleus pulposus and contributes to the degeneration and apoptosis of human nucleus pulposus cells. Mol Med Rep. 2017; 16: 4730-4736.
10. Guinto Jr FC, Hashim H, Stumer M. CT demonstration of disk regression after conservative therapy. AJNR Am J Neuroradiol. 1984; 5: 632.
11. SAAL JA, SAAL JS, HERZOG RJ. The natural history of lumbar intervertebral disc extrusions treated nonoperatively. Spine. 1990; 15: 683-686.
12. 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 outcome. J Orthop Surg. 2001; 9: 1-7.
13. Bozzao A, Gallucci M, Masciocchi C, et al. Lumbar disk herniation MR imaging assessment of natural history in patients treated without surgery. Radiology. 1992; 185: 135-141.
14. Chiu CC, Chuang TY, Chang KH, et al. The probability of spontaneous regression of lumbar herniated disc a systematic review. Clin Rehabil. 2015; 29: 184-195.
15. Ma Z, Yu P, Jiang H, et al. Conservative treatment for giant lumbar disc herniation clinical study in 409 cases. Pain Physician. 2021; 24: E639.
16. Rittweger J, Just K, Kautzsch K, et al. Treatment of chronic lower back pain with lumbar extension and whole-body vibration exercise a randomized controlled trial. Spine. 2002; 27: 1829-1834.
17. Dincher A, Wydra G, Schwarz M. Whole Body Vibration–A Helpful Treatment for Low Back Pain? A Systematic Review and Meta-analysis. Exploratory Research and Hypothesis in Medicine. 2022; 7: 154-164.