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Morphological Assessment for Application of Biopuncture and Myofascial Release in Lumbar Hernia Rehabilitation-Case report

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Lumbar disc herniation is a prevalent spinal disorder associated with low back pain, radiculopathy, and functional impairment. This report describes a 36-year-old patient presenting with low back pain and tibial paresis who underwent a 4-month, protocol-based rehabilitation program. Morphological assessment of degenerative changes in lumbar spine by MRI was applied for development of novel therapeutic approach integrated biopuncture (Traumeel SR, Lyphomiosot, Discus Compositum), myofascial release therapy, analytical gymnastics and electrotherapeutic modalities including magnetotherapy and transcutaneous electrical nerve stimulation (TENS). Clinical outcomes were evaluated using the Visual Analog Scale (VAS), manual muscle testing(MMT), the Timed Up and Go test, and the Roland–Morris Disability Questionnaire. The patient demonstrated substantial reductions in pain and muscle hypertonicity, improved gait control, and enhanced overall functional status. This case underscores the potential value of multimodal rehabilitation strategies based on patho-morphological assessment using MRI in the management of lumbar disc–related low back pain.

Key words: biopuncture, MRI scan, lumbar disc herniation, myofascial release therapy

Introduction

Approximately 80% of individuals experience low back pain over their lifetime, generating more than $100 billion in annual healthcare expenditures in the United States. The condition affects 1–3% of the population each year, with peak prevalence among adults aged 30–50 [8]. Lumbar disc herniation constitutes a major contributor to this burden, leading to substantial reductions in functional capacity and quality of life. Low

back pain is further associated with psychological comorbidities such as depression and anxiety**,** both of which may adversely influence clinical outcomes [2]. We performed morphological assessment of degenerative changes in lumbar spine by MRI for development of novel strategy for treatment and rehabilitation of lumbar hernia.

Case report

A 36-year-old woman with obesity presented with severe low back pain, right ankle pain, numbness along the right lower limb, and progressive gait impairment. She had completed a 6-day course of NSAIDs (nonsteroidal anti-inflammatory drugs), mannitol, dexamethasone, and B-complex vitamins in a Neurology department prior to admission.

On examination, she was alert, cooperative, and fully oriented, with intact cranial nerve function. Gait was cautious with a mild right-sided limp, and pain intensified with exertion and transitions from sitting to standing. The straight-leg-raise test was positive on the right at 30–40°, eliciting radiating pain along the sciatic nerve to the lateral foot.

Sensory assessment demonstrated pain, paresthesias, and hypoesthesia in the right S1 dermatome, with a Visual Analog Scale (VAS) score of 9. Motor testing revealed mild weakness of right plantar flexion (m. triceps surae), graded 3/5 on manual muscle testing, and reduced performance on toe-walking, while dorsiflexion remained preserved. The deficit pattern was consistent with tibial nerve involvement secondary to S1 root compression. The right Achilles reflex was diminished; patellar reflexes were symmetric. No pathological reflexes were present, and sphincter control was intact. The clinical findings were indicative of right-sided S1 radiculopathy with mild tibial paresis.

Morphological observations by MRI of the lumbosacral spine demonstrated degenerative changes of the L5–S1 intervertebral disc, characterized by reduced T2 signal intensity and decreased disc height. A right-sided paramedian disc herniation with a broad base was identified, extending into the right lateral recess and compressing the right S1 nerve root, accompanied by deformation of the adjacent dural sac (**Figs. 1, 2**).

The patient completed two rehabilitation courses, the first lasting 7 days and the second 10 days, separated by an interval of approximately 15 days. The rehabilitation program consisted of transcutaneous electrical nerve stimulation (TENS)**,** magnetotherapy**,** biopuncture (Lymphomiosot, Discus Compositum, Traumeel SR), and kinesitherapy with emphasis on myofascial release techniques. During the initial course, the patient additionally received dexamethasone according to a structured regimen. Following completion of the first rehabilitation phase, pregabalin 75 mg was prescribed for one month, alongside ibuprofen as needed and a proton pump inhibitor.

Clinical evaluation demonstrated a significant reduction in pain intensity, accompanied by improved lower-limb muscle strength, mobility, and gait performance**.**

Fig. 1. Axial MRI at L5–S1 showing a right paramedian disc herniation with mass effect on the S1 nerve root.

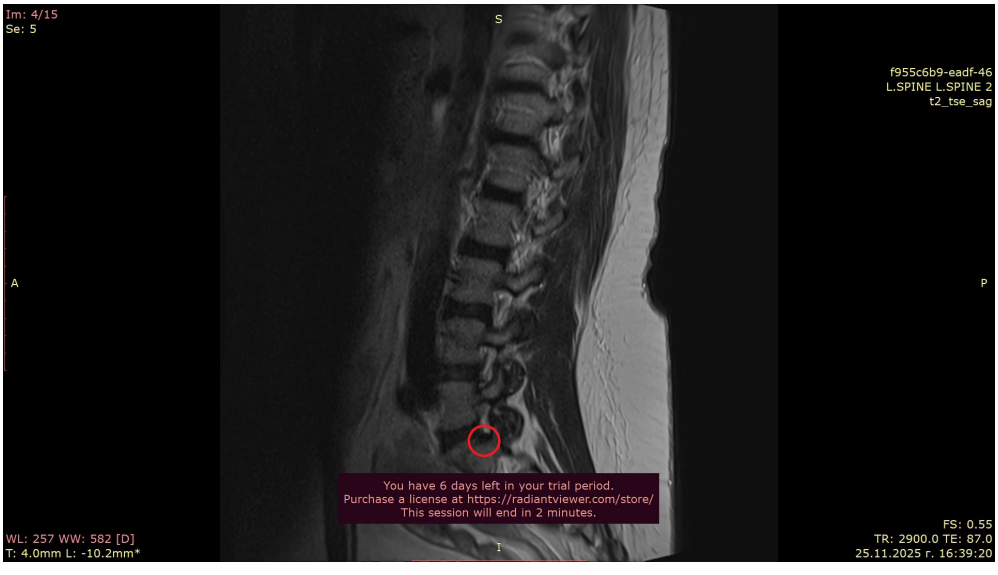

Fig. 2. Sagittal T2weighted MRI of the lumbar spine showing degenerative changes and a rightsided paramedian L5–S1 disc herniation with mass effect on the S1 nerve root.

These functional gains were associated with a measurable enhancement in overall quality of life. The outcomes are summarized in **Table 1**.

Table1. Clinical Measures at Beginning and End of treatment

Measure	Beginning of the treatment	End of the treatment
VAS	9	3
MMT	3	5
TUG	40 sec.	15 sec.
Roland–Morris Disability Questionnaire	19	4

Discussion

The presented clinical case is particularly valuable, as it demonstrates a situation in which the severity of clinical symptoms and patho-morphological imaging findings would suggest surgical treatment, yet significant improvement is achieved through a multimodal conservative approach. The patient presents with pronounced pain syndrome, radicular symptoms along the course of S1, and the presence of a motor deficit – a combination that in clinical practice is often interpreted as a relative indication for surgical decompression.

A key aspect of the case is the discrepancy between the patho-morphological imaging findings and the clinical outcome. The presence of nerve root compression and dural sac deformation on MRI does not lead to progression; on the contrary, it leads to clinical improvement following conservative therapy. This corresponds to contemporary data showing that morphological changes do not always correlate with symptoms and prognosis, which limit their value as an independent predictor for therapeutic decisions [1, 3].

Modern pathophysiological concepts consider lumbar disc herniation as a multifactorial condition. In addition to mechanical compression, inflammatory and biochemical mechanisms play a key role. The herniated disc material induces the release of pro-inflammatory cytokines, such as TNF-α, IL-1β, and IL-6, which lead to sensitization of neural structures and sustain the pain syndrome [6]. This explains the clinically observed discrepancy between the degree of compression and the severity of symptoms. Additionally, there is evidence that the inflammatory process is also involved in the spontaneous resorption of disc material, observed in a significant percentage of patients (up to 60–90%), which accounts for the potential for a favorable outcome with conservative treatment [9]. This emphasizes the need for careful individualization of the therapeutic approach.

In this context, the choice of therapy targeting the inflammatory component can be pathophysiologically justified. Biopuncture, although with a limited high-quality

evidence base, can be considered as a method for local modulation of inflammation and pain. Some experimental and clinical data indicate that the used preparations have the potential to influence pro-inflammatory mediators and support regulatory processes [4]. The myofascial component is also of essential importance. Secondary musculoskeletal-fascial disorders, including increased muscle tone and the formation of trigger points, can maintain the pain syndrome independent of the primary disc pathology. Contemporary systematic reviews show that myofascial release can lead to a statistically significant reduction in pain and improvement in function in patients with lumbar pain [7].

From the perspective of clinical behavior, the presented case supports the recommendation that indications for surgical treatment should be based primarily on clinical dynamics. Contemporary guidelines emphasize that surgery is indicated in the presence of progressive neurological deficit or persistent, therapy-resistant pain [3, 5]. In this case, the absence of deterioration and the reported improvement indicate that the mechanical compressive factor is not dominant and does not necessitate surgical intervention.

Conclusion

In conclusion, the case illustrates how morphological assessment by MRI can help for contemporary understanding of lumbar disc herniation as a multifactorial condition in which mechanical, inflammatory, and myofascial factors interact. It emphasizes the importance of an integrated therapeutic approach and demonstrates that conservative treatment can be effective even in the presence of a neurological deficit.

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