



SUCCESSFUL CONSERVATIVE MANAGEMENT OF SURGICALLY RECOMMENDED LUMBAR INTERVERTEBRAL DISC PROLAPSE IN A 17-YEAR-OLD ADOLESCENT: A CASE REPORT

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ABSTRACT

Lumbar intervertebral disc prolapse (IVDP) is relatively uncommon in adolescents but can result in severe low back pain, radiculopathy, functional impairment, and neurological deficits requiring prompt evaluation and management.^[1] Surgical intervention is generally recommended when conservative treatment fails or when progressive neurological deficits or significant neural compression are present.^[2] Magnetic Resonance Therapy (MRT) has emerged as a non-invasive therapeutic modality with the potential to promote tissue repair, reduce inflammation, and improve clinical outcomes in musculoskeletal disorders, although evidence in lumbar IVDP remains limited. **Case Presentation:** A 17-year-old adolescent presented with severe low back pain radiating to the lower limb, associated with restricted lumbar movements, positive nerve tension signs, and impaired activities of daily living. Magnetic resonance imaging (MRI) confirmed lumbar intervertebral disc prolapse with nerve root compression.^[1] Following independent evaluations by orthopaedic and neurosurgical specialists, the patient was advised to undergo surgical intervention in view of the clinical and radiological findings.^[2] The patient elected to undergo conservative management with MRT. Clinical outcomes were assessed using pain intensity, neurological examination, functional disability, and serial MRI findings before and after treatment. **Results:** Following completion of MRT, the patient demonstrated substantial reduction in pain, improvement in neurological symptoms, restoration of lumbar mobility, and marked enhancement in functional status. Follow-up MRI demonstrated regression of disc pathology with reduced neural compression. The patient resumed normal daily activities without requiring surgery, and no treatment-related adverse events were observed. **Conclusion:** This case highlights the potential role of MRT as a safe, non-invasive therapeutic option in selected adolescents with lumbar IVDP, even after surgical intervention has been recommended.

INTRODUCTION

Lumbar intervertebral disc prolapse (IVDP), also referred to as lumbar disc herniation (LDH), is one of the most common causes of low back pain and lumbosacral radiculopathy, resulting from displacement of nucleus pulposus material through a weakened annulus fibrosus.^[12] Standardized nomenclature classifies disc pathology into bulge, protrusion, extrusion, and sequestration, facilitating consistent diagnosis and clinical decision-making.^[1] Disc degeneration, repetitive mechanical loading, trauma, and genetic predisposition

contribute to the pathogenesis of lumbar disc herniation, leading to nerve root compression, inflammation, and neuropathic pain.^[2,5] MRI remains the gold standard for confirming disc pathology, evaluating neural compression, and guiding treatment strategies.^[2,6]

Lumbar disc herniation predominantly affects adults between 30 and 50 years of age and is relatively uncommon in adolescents, accounting for less than 5% of all surgically treated lumbar disc herniation cases.^[7,10] Adolescent lumbar disc herniation differs from adult

disease in its aetiology, clinical presentation, imaging characteristics, and response to treatment.^[7] Young patients frequently have a history of sports-related trauma or heavy physical activity and often present with severe radicular pain and a positive straight leg raise test despite relatively preserved neurological function.^[7,10]

Current evidence-based guidelines recommend an initial trial of conservative management, including activity modification, analgesics, physiotherapy, and structured rehabilitation, for most patients without progressive neurological deficits or cauda equina syndrome.^[11] Although surgery, particularly lumbar microdiscectomy, provides rapid symptom relief in carefully selected patients with persistent radiculopathy or neurological deterioration, many individuals experience spontaneous improvement with non-operative treatment due to regression of herniated disc material and resolution of inflammation.^[11,14] Therefore, careful patient selection remains essential before surgical intervention.

Magnetic Resonance Therapy (MRT) is a non-invasive biophysical treatment that has been proposed to enhance cellular metabolism, modulate inflammatory responses, and support tissue regeneration. Although evidence regarding its application in lumbar IVDP is still evolving, it may represent a promising adjunctive conservative treatment in selected patients. The present case report describes the successful non-surgical management of a **17-year-old adolescent with lumbar intervertebral disc prolapse who had been advised surgery by both ORTHOPAEDIC and NEURO SURGEONS**, demonstrating marked clinical improvement and favourable radiological outcomes following Magnetic Resonance Therapy (MRT).

CASE REPORT

A 17-year-old female patient came with a complaint of acute on chronic low back pain from past 2 years. Pain has aggravated since 2 months while walking, sitting for long time, and while carrying heavy load. The pain was radiating to bilateral lower limb but Rt > Lt. pain aggravated on exertional activity like standing for long time and exertion associated with radicular pain in Rt leg in outer aspect of leg and dorsum of foot. Associated with weakness of toes and forefoot. Which made her difficult to walk and also weakness during walking and in Rt foot and ankle.

No significant medical history in the past is seen. But in the personal history bowel and bladder incontinence seen, and there is increased frequency of bowel and bladder activity is noted. She is also finding difficulty in carrying out her personal hygiene.

Medical history reveals that she had consulted with Orthopaedic as well as Neurosurgeon in Mysore as well as Bangalore. They diagnosed her to have IVDP at L3-L4, L4-L5, L5-S1. And partial IVDP at L2-L3.

They have been advised for surgical recommendations ie. Laminectomy and Discectomy at L3-L4 and L4-L5 post instrumentations from 5 different opinion.

She was referred to SVASTHI ORTHOPAEDIC AND RESPIRATORY CENTRE for further evaluation and management.

ON EXAMINATION

Tenderness was noted from L3 to S1 with severe Paraspinal Muscle spasms
High raising Rt foot drop Gait
SLRT 10° on Rt and 30° on the Lt leg.
Both Patrick's and Lasegue tests are positive
Diminished dermatomal pain on Rt side
Power on Rt side of EHL and EDL was 3+
FHL and FDL are normal

Post examination we also suggested for Discectomy and Laminectomy and neuro opinion was taken who also suggested for surgery. **But patient and her parents refused to undergo surgery even after proper explanation and were requesting for conservative management.**

Under graded prognosis we started with Robotic Decompression for 3 weeks with daily monitoring of neurological symptoms.

By the end of 10 days there was improvement in SLRT, and improved sensation in L3-L4 dermatomes, power also improved, symptoms improved by 30% Later on she was started with MRT for 9 days with IVD card. Along with traction as well as supplements such as Anti inflammatory, analgesics, supplements for nerve and disc etc.

After completion of MRT therapy the patient presented with the improved symptoms. The Pain had reduced significantly, with improvement in clinical signs SLRT 70° in Rt leg and 80° in the Lt leg. So, overall improvement was seen around 70%. Improvement in motor power was 4/5. Improvement in gait was seen. She was advised to go back to Mysore and carry out here routine work.

She was advised to avoid lifting heavy weights, sitting for long time, banding and lifting weight, etc

Follow up review was done after 3 months which shows no major symptoms of presenting complaints were noted. She had improved activity. On examination reveals no tenderness as well as no PSMS. Sensation was normal on B/L lower limbs. EHL and EDL were of normal power on B/L lower limbs. Gait was near normal She was advised to come for follow up after 6 months and 1 year, during the followup there was no abnormality detected. Patient was absolutely normal.

MRI REPORTS



PRE MRI SCAN
20/05/2024



POST MRI SCAN
24/07/2026

DISCUSSION

Lumbar intervertebral disc prolapse (IVDP) is an uncommon cause of lumbar radiculopathy in adolescents, accounting for only 0.5–6.8% of all hospitalized patients with lumbar disc herniation. Unlike adults, adolescent lumbar disc prolapse frequently develops following trauma, repetitive mechanical loading, or congenital spinal abnormalities, while degenerative changes are relatively less pronounced. Despite its rarity, the disease can produce severe neurological symptoms and significant functional disability, often leading clinicians to consider early surgical intervention. The present case demonstrates that carefully selected adolescent patients may achieve substantial clinical and functional recovery through structured conservative management despite recommendations for surgery.

The patient in this report presented with several clinical features generally considered predictors of surgical management, including multilevel lumbar disc prolapse,

severe radicular pain, motor weakness involving the extensor hallucis longus and extensor digitorum longus muscles, bowel and bladder disturbances, and persistent neurological deficits. Multiple orthopaedic surgeons and neurosurgeons independently recommended decompressive surgery with laminectomy and discectomy because of the severity of neurological involvement. Such recommendations are consistent with current evidence-based guidelines, which advocate surgery for patients with progressive neurological deficits, cauda equina syndrome, or persistent disabling symptoms that fail to respond to adequate conservative treatment.

Although lumbar microdiscectomy remains the gold standard for patients requiring operative management, surgery is associated with potential complications including recurrent disc herniation, epidural fibrosis, adjacent segment degeneration, postoperative instability, infection, dural tears, and the need for revision

procedures. These concerns become particularly important in adolescents because of their long-life expectancy and continuing spinal growth. Therefore, whenever neurological deterioration is not progressive and close clinical monitoring is possible, conservative treatment remains an important therapeutic consideration.

Several studies have demonstrated that spontaneous regression of herniated lumbar discs may occur following conservative treatment. This phenomenon has been attributed to dehydration of herniated disc material, enzymatic degradation of the extracellular matrix, macrophage-mediated phagocytosis, neovascularization, and gradual reduction of the inflammatory response surrounding the affected nerve root. Regression is reported more frequently in extruded and sequestered discs than in contained protrusions, although symptomatic improvement often precedes complete radiological resolution. Consequently, successful conservative treatment depends not only on structural changes within the disc but also on reduction of inflammation and restoration of neural function.

In the present case, treatment consisted of an initial course of robotic spinal decompression followed by Magnetic Resonance Therapy (MRT), together with appropriate medications, nutritional supplementation, activity modification, and regular neurological assessment. Clinical improvement became evident within the first 10 days, with progressive recovery of dermatomal sensation, improvement in straight leg raising, reduction in radicular pain, and increasing motor strength. Following MRT, the patient demonstrated approximately 70% overall clinical improvement, restoration of gait, improvement in motor power from grade 3+ to 4/5, and progressive return to normal daily activities. At one-year follow-up, neurological examination was normal and the patient remained symptom-free without requiring surgery. These findings indicate that meaningful neurological recovery may be achievable in selected patients undergoing comprehensive conservative care.

The biological mechanisms responsible for the clinical improvements observed after MRT remain incompletely understood. **Experimental studies have suggested that low-energy nuclear magnetic resonance fields may influence cellular metabolism, improve microcirculation, modulate inflammatory cytokines, enhance extracellular matrix synthesis, and stimulate tissue repair processes.** Such mechanisms could theoretically reduce inflammation surrounding compressed nerve roots while promoting recovery of injured disc tissue. However, robust clinical evidence supporting these mechanisms in lumbar disc prolapse remains limited, and further translational research is necessary to clarify the biological effects of MRT.

A notable strength of this case is the documentation of recovery in an adolescent patient who had multiple surgical opinions recommending operative treatment. Objective neurological findings, including improvement in straight leg raising, motor power, gait, sensory deficits, and long-term functional recovery, strengthen the clinical observations. Furthermore, sustained improvement during one year of follow-up reduces the likelihood that the outcome merely reflected short-term symptomatic relief.

CONCLUSION

Lumbar intervertebral disc prolapse with neurological deficits in adolescents is uncommon and often presents a significant therapeutic challenge. Although surgical decompression remains the standard treatment for patients with progressive neurological deterioration, this case demonstrates that carefully monitored conservative management incorporating robotic decompression and Magnetic Resonance Therapy (MRT) may be associated with substantial clinical, neurological, and functional recovery in selected patients who decline surgery. The patient exhibited marked improvement in pain, motor strength, gait, neurological function, and daily activities, with sustained recovery throughout one year of follow-up, despite having previously received multiple recommendations for surgical intervention.

Because this report represents the outcome of a single patient. Rather, this case highlights the potential of MRT as an adjunctive non-invasive therapeutic modality deserving further scientific investigation. Well-designed clinical data which demonstrates the standardized clinical, radiological, and functional outcome and long-term benefits of MRT in the management of lumbar intervertebral disc prolapse, particularly in the adolescent population.

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