

Patient Experience and Outcomes in the First Year of Conservative Management for Prolapsed Intervertebral Disc (PIVD)

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Abstract: Introduction: Prolapsed intervertebral disc (PIVD) is a common spinal disorder causing pain and functional limitations. Conservative management, including physical therapy, medications, and lifestyle modifications, is often the first line of treatment. This study explores the experiences and outcomes of patients undergoing conservative management during their first year of PIVD diagnosis.

Methods: A retrospective and descriptive analysis was conducted on patients diagnosed with PIVD who opted for conservative management. Data on patient-reported outcomes, pain levels (using a Visual Analog Scale), functional status (assessed via Oswestry Disability Index), and overall satisfaction were collected through interviews and medical records over 12 months.

Results: Among the 100 patients studied, 75% reported significant pain reduction by the end of the first year, while 68% experienced improved functional abilities. Early compliance with physical therapy and adherence to prescribed medications were strongly correlated with better outcomes. However, 12% required surgical intervention due to persistent or worsening symptoms. Challenges reported included difficulty maintaining therapy routines, delayed symptom relief, and the emotional burden of chronic pain.

Conclusion: Conservative management for PIVD can effectively alleviate symptoms and improve function during the first year for most patients. Early intervention, patient education, and tailored treatment plans are critical to achieving optimal outcomes. Addressing patient concerns and barriers to compliance can further enhance the success of conservative approaches.

Keywords: PIVD, conservative management, patient experience, physical therapy, pain management, functional recovery.

Introduction

Prolapsed intervertebral disc (PIVD), commonly referred to as a herniated or slipped disc, is a prevalent cause of low back and radicular pain. It occurs when the nucleus pulposus of the intervertebral disc protrudes through the annulus fibrosus, often compressing adjacent nerve roots. The prevalence of PIVD is significant, with lifestyle factors such as poor posture, sedentary habits, and occupational stress.¹ Surgical intervention is indicated for patients with symptoms, conservative management remains the primary approach for the majority. This paper analyses the effectiveness of conservative treatment in managing PIVD and explores factors affecting patient outcomes.

Review of Literature

PIVD primarily results from degenerative changes within the intervertebral disc, leading to reduced disc hydration and elasticity. Other contributing factors include excessive mechanical stress, trauma, genetic predisposition, and occupational hazards. The condition typically affects the lumbar spine, particularly at L4-L5 and L5-S1 levels, due to increased biomechanical load in these regions. The protruding disc material exerts pressure on nerve roots, resulting in radicular pain, sensory deficits, and motor weakness.^{1,2}

Grading of PIVD²

PIVD is classified based on the severity and extent of disc herniation. The following grading system is used:

Bulging Disc (Grade I): Mild protrusion of the intervertebral disc beyond its normal boundary. Annulus fibrosus remains intact. Often asymptomatic or presents with mild discomfort.

Protrusion (Grade II): Disc material extends further but remains contained within the annulus fibrosus. May cause localized pain and mild nerve root irritation.

Extrusion (Grade III): The nucleus pulposus breaches the annulus fibrosus but remains connected to the disc. Often results in significant pain, nerve compression, and radiculopathy.

Sequestration (Grade IV): The nucleus pulposus completely escapes and becomes a free fragment in the spinal canal. Severe symptoms, including neurological deficits, may occur. Often requires surgical intervention.

Symptomatology of Patients with PIVD commonly present with lower back pain radiating to one or both lower limbs, numbness, tingling sensations, and, in severe cases, muscle weakness like Foot Drop. Diagnosis is established through clinical examination, history taking, and imaging studies, including MRI and CT scans, which help in assessing disc morphology and nerve root involvement.

Conservative Management Approaches

Conservative management of PIVD involves a multimodal approach that includes physical therapy, pharmacological interventions, and lifestyle modifications.^{3,4}

Physical Therapy includes Exercise programs focusing on core stabilization, lumbar extension, and flexibility play a crucial role in recovery. Techniques such as McKenzie exercises and hydrotherapy are commonly used.⁵

Physiotherapy for Core Stabilization and Strengthening are preferred exercises. Core stabilization exercises play a critical role in the conservative management of PIVD.^{6,7} Strengthening the core muscles, including the deep

stabilizers of the lumbar spine, helps improve spinal support, reduce pain, and enhance functional movement^{8,9,10}.

A structured physiotherapy program is required with personalised approach for patients, which consists of the following components-

Activation of Deep Core Muscles

1. Transverse Abdominis Activation- Patients are trained to contract their lower abdominal muscles while maintaining normal breathing.
2. Pelvic Tilt Exercises: Performed in supine and standing positions to engage the deep core and lumbar stabilizers.
3. Abdominal Bracing: Encourages isometric contraction of the Transverse Abdominis and multifidus muscles without spinal movement.

Isometric Core Strengthening exercises involve

1. Planks: Front and side planks strengthen the entire core while reducing spinal stress.
2. Bird-Dog Exercise: Enhances lumbar stability and promotes coordination between core and limb movements.
3. Dead Bug Exercise: Strengthens the core while minimizing spinal load, ideal for beginners.

Dynamic Core Muscle Exercises involve

1. Bridge Exercises: Strengthen the glutes and lower back, improving posterior chain stability.
2. Swiss Ball Exercises: Engage multiple muscle groups to enhance balance and coordination.
3. Leg Raises: Improve lower abdominal strength while maintaining a neutral spine position.

Functional Strengthening Movements involve

1. Squats and Lunges: Performed with proper form to activate core stabilizers and improve lower body strength.

2. Resistance Band Exercises: Incorporate controlled movements to strengthen oblique muscles and back extensors.
3. Cable or Weight-Based Core Work: Introduces progressive resistance to challenge core endurance.

Exercises which improve Flexibility and Mobility Work are

1. Cat-Cow Stretch: Enhances spinal mobility and reduces stiffness.
2. Child's Pose: Relieves lower back tension and promotes relaxation.
3. Hamstring and Hip Flexor Stretching: Reduces strain on the lower back by improving flexibility.

Other than exercises Neuromuscular Re-Education plays a vital role, it involves

1. Proprioceptive Training: Balancing on unstable surfaces (such as a Bosu ball) to improve coordination and stability.
2. Postural Correction Drills: Encouraging optimal spinal alignment during daily activities to prevent recurrent injuries.

A progressive and individualized approach is key to optimizing patient recovery. The exercises should be performed under supervision initially and gradually progressed based on tolerance and strength gains. Consistency and adherence to physiotherapy protocols are critical for long-term success in managing PIVD conservatively.

Medical Management involve Nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, and medications for neuropathic pain modulators to help in pain management. In some cases, epidural steroid injections are also advised to provide relief.

Most importantly Lifestyle Modifications are to be advised, as the disease is precipitated by poor life style. Ergonomic adjustments, weight management, and activity modification are recommended to reduce mechanical strain on the spine.

Methodology for the present Study-

This retrospective study analysed the outcomes of 100 patients diagnosed with PIVD who underwent conservative treatment for a duration of one year at our clinic. Patient data, including pain scores (measured using the Visual Analog Scale, VAS) and functional improvement (assessed via the Oswestry Disability Index, ODI), were reviewed.

1. Pain Scores Measured Using the Visual Analog Scale (VAS) ¹¹

The Visual Analog Scale (VAS) is widely used and validated tool. It is meant to assess pain intensity in patients with PIVD. It is a simple, subjective measure that consists of a 10-centimeter horizontal or vertical line, where:

0 cm represents “no pain.” And 10 cm represents “worst imaginable pain.”

Patients are asked to mark a point on the line that best corresponds to their perceived pain intensity. The distance from the “no pain” end to the patient’s mark is measured in centimetres and recorded as the pain score. This method provides a continuous scale for pain measurement, making it more sensitive than categorical scales.

VAS Score Interpretation:

0-1 cm: Minimal or no pain

1-3 cm: Mild pain, usually manageable without medication

4-6 cm: Moderate pain, often requiring analgesics and affecting daily activities

7-10 cm: Severe pain, significantly impacting quality of life and requiring intensive pain management strategies

In present study, VAS scores were recorded at baseline, mid-treatment (6 months), and post-treatment (12 months). The average pain reduction among patients undergoing conservative management was as follows:

Baseline Mean VAS Score: 7.2 ± 1.5

6-Month Mean VAS Score: 4.3 ± 1.8

12-Month Mean VAS Score: 2.1 ± 1.6

75% of patients experienced a clinically significant reduction in pain ($\geq 50\%$ decrease in VAS score). Early adherence to therapy and lifestyle modifications correlated with greater pain relief. Patients with higher baseline VAS scores (>8 cm) were advised additional interventions, including pharmacological management or epidural steroid injections. 12% of patients with persistent high VAS scores (>6 cm after 12 months) eventually underwent surgical intervention.

2. Oswestry Disability Index (ODI) for Functional Assessment ¹¹

The Oswestry Disability Index (ODI) is a well-established assessment tool used to evaluate disability levels in individuals experiencing lower back pain, including those with PIVD. It assesses the impact of pain on daily activities and overall functional ability.

Method of Measurement:

The ODI consists of 10 sections, each addressing a different aspect of daily living affected by back pain: Pain intensity; Personal care (washing, dressing, etc.); Lifting; Walking; Sitting; Standing; Sleeping; Social life; Traveling; Employment or homemaking

Each section is scored from 0 to 5, with higher scores indicating greater disability. The total score is calculated as:

ODI Score Interpretation:

0-20%: Minimal disability – Patient can cope with most daily activities.

21-40%: Moderate disability – Pain interferes with daily activities but does not entirely prevent them.

41-60%: Severe disability – Significant impairment, with daily activities being severely affected.

61-80%: Crippling disability – Pain restricts almost all activities, requiring intensive management.

81-100%: Bed-bound or highly incapacitated.

In this study, ODI scores were recorded at baseline, mid-treatment (6 months), and post-treatment (12 months). The functional improvement among patients undergoing conservative management was as follows:

Baseline Mean ODI Score: 52.4 ± 10.3 (severe disability)

6-Month Mean ODI Score: 34.1 ± 8.9 (moderate disability)

12-Month Mean ODI Score: 18.5 ± 7.6 (minimal disability)

68% of patients showed significant functional improvement ($\geq 40\%$ decrease in ODI score). Early adherence to physiotherapy and lifestyle changes led to better functional recovery. Patients with an initial ODI score above 60% were more likely to require multidisciplinary pain management or surgical intervention.

Those who achieved an ODI score below 20% at 12 months could return to normal daily activities with minimal restrictions.

Results

Pain Reduction was noted in majority with conservative management. 75% of patients reported significant pain reduction (VAS score improvement of $>50\%$). Similarly Functional Improvement was noted in majority of patients. 68% showed enhanced mobility and reduced disability (ODI score improvement of $>40\%$).

Partial or no response of conservative management in patients then required Surgical Requirement. 12% of patients eventually required surgical intervention due to persistent or worsening symptoms.

In the study it was noted that adherence to therapy protocols significantly impacted outcomes. Patients who engaged in regular physiotherapy and lifestyle modifications experienced better recovery rates. Common challenges included therapy non-compliance and psychological distress due to chronic pain.



Figure 1 Bulging Disc at L3-L4, L4-L5



Figure 2 Bulging Disc L5-S1



Figure 3 Bulging Disc L4-L5



Figure 4 Bulging Disc L4-L5



Figure 5 Sequestration L4-L5



Figure 6 Extrusion L5-S1

Discussion

The findings indicate that conservative management is effective in a majority of PIVD cases. Early intervention and patient adherence to prescribed therapies are critical in optimizing outcomes. However, a subset of patients with severe disc herniation or refractory symptoms require surgical intervention. The psychological impact of chronic pain underscores the need for a holistic treatment approach, incorporating counselling and support programs. Treatment assessment and follow up require symptomatic relief and Radiological assessment with help of MRI scans.¹²

Conclusion

Conservative management remains the first-line treatment for PIVD, with most patients experiencing significant pain relief and functional

improvement. Early intervention, patient education, and personalized care plans are essential for achieving optimal recovery.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.