The Journal of Teachers Association
ISSN 1019-8555 (Print) & ISSN 2408-8854 (Online)
Frequency: Bi-Annual
DOI: https://doi.org/10.62469/taj.v037i01.0377

OPEN ACCESS
Website: www.tajrmc.com
Email: editor@tajrmc.com
Volume-37 | Issue-1 | Jan-Jun 2024

Clinical Profile and Outcomes of Patients with Lumbar Disc Prolapse Undergoing Conservative versus Surgical Management in a Tertiary Hospital of Bangladesh

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Abstract: ***Background:*** Lumbar disc prolapse is one of the most common causes of low back pain and sciatica, affecting individuals in their most productive years. It occurs when the intervertebral disc herniates and compresses adjacent nerve roots, leading to varying degrees of pain, sensory disturbances, and functional impairment. This study aims to evaluate and compare the clinical presentation and treatment outcomes of patients with lumbar disc prolapse who underwent either conservative or surgical management. ***Methods:*** This comparative observational study was conducted at National Institute of Traumatology & Orthopaedic Rehabilitation (NITOR) and the Orthopedic Department of Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, Bangladesh from January to December 2022. It included 100 patients with MRI-confirmed lumbar disc prolapse, divided into two equal groups: 50 received conservative treatment (rest, analgesics, physiotherapy) and 50 underwent surgical intervention (discectomy or decompression). Statistical analysis was performed using SPSS version 25, with a p-value <0.05 considered statistically significant. ***Result:*** In this study of 100 patients with lumbar disc prolapse, both conservative and surgical groups showed significant improvement in pain, but surgical patients experienced greater and faster relief (VAS reduction: 6.7 vs 4.4; p=0.001). Disc extrusion and neurological deficits were more common in the surgical group. While conservative management had a higher symptom recurrence (10% vs 4%), surgical patients experienced minor complications like wound infection (6%) and transient nerve irritation (8%). Overall, surgical treatment provided better short-term outcomes in selected patients. ***Conclusion:*** This study demonstrates that both conservative and surgical treatments are effective for lumbar disc prolapse, but surgery provides faster and greater pain relief, especially in cases with prolonged symptoms, neurological deficits, or disc extrusion on MRI. Conservative management remains suitable for milder cases, emphasizing the need for individualized treatment based on clinical severity and imaging findings.

Keywords: Lumbar Disc Prolapse, Clinical Profile, Conservative Management, Surgical Management.

Original Researcher Article

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How to cite this article:
Dutta S, Kundu S, Mamun AA, Musa M, Rahman MS; Clinical Profile and Outcomes of Patients with Lumbar Disc Prolapse Undergoing Conservative versus Surgical Management in a Tertiary Hospital of Bangladesh. Taj 2024;37 (1): 300-305.

Article history:
Received: December 18, 2023
Accepted: February 22, 2024

INTRODUCTION

Lumbar disc prolapse (LDP), commonly referred to as a herniated or slipped disc, is one of the most prevalent causes of low back pain (LBP) and radiculopathy worldwide.[1] It occurs when the nucleus pulposus protrudes through a weakened annulus fibrosus, leading to compression of spinal nerve roots and subsequent neurological symptoms such as back pain, sciatica, paresthesia, or even motor deficits depending on the level and extent of herniation.[1] LDP predominantly affects individuals aged 30 to 50 years and poses a substantial burden on quality of life and productivity, particularly in low- and middle-

income countries.[2] Low back pain has a global lifetime prevalence of approximately 70–80%, with lumbar disc herniation being a significant contributor, especially among working-age populations.[3] In Bangladesh, with increasing urbanization, poor ergonomics, sedentary lifestyles, and delayed healthcare access, LDP is an emerging public health concern.[4] However, there is a scarcity of local data highlighting the clinical presentation and management outcomes of LDP, making region-specific analysis crucial.The most frequently involved disc levels in LDP are L4–L5 and L5–S1, where mechanical loading and mobility are maximal.[5]

Clinically, patients may present with localized low back pain, radiating leg pain (sciatica), numbness, tingling sensations, and in severe cases, bladder or bowel dysfunction suggesting caudaequina syndrome.[6] Diagnosis is confirmed using magnetic resonance imaging (MRI), which remains the gold standard due to its high sensitivity and specificity for disc pathology and nerve root involvement.[7] Management of lumbar disc prolapse can be broadly classified into conservative (non-operative) and surgical approaches. Conservative treatment is usually recommended for patients without severe neurological deficits and includes a combination of physical therapy, non-steroidal anti-inflammatory drugs (NSAIDs), analgesics, epidural steroid injections, and activity modifications.[8] Several studies have indicated that 70–90% of patients respond favorably to conservative treatment within 6–12 weeks.[9] Surgical intervention is reserved for patients with intractable pain, progressive neurological deficits, or failed conservative management. Common surgical techniques include open discectomy, microdiscectomy, and minimally invasive discectomy, aimed at decompressing the nerve root and alleviating symptoms.[10] Among these, microdiscectomy has gained widespread acceptance due to reduced tissue trauma, shorter hospital stays, and quicker return to activities.[11]

Although surgical treatment provides more rapid symptomatic relief, studies suggest that long-term functional outcomes may be similar to those achieved with conservative therapy.[12] The decision between conservative and surgical management depends on multiple factors, including symptom severity, duration, neurological involvement, patient expectations, socioeconomic status, and access to specialized care.[13] In countries like Bangladesh, where many patients present late due to lack of awareness, financial constraints, or reliance on traditional remedies, treatment outcomes may differ significantly from those observed in high-income countries.[4] Despite the high clinical burden of LDP, few studies from Bangladesh have systematically compared the clinical profiles and treatment outcomes between patients managed conservatively and those undergoing surgery. There is a pressing need for data from tertiary-level hospitals in the country to better inform local clinical guidelines, improve decision-making, and tailor management approaches based on patient characteristics and available resources. This study, therefore, aims to evaluate and compare the clinical presentation and treatment outcomes of patients with lumbar disc prolapse who underwent either conservative or surgical management at a tertiary care hospital in Bangladesh.

METHODS

This comparative observational study was conducted at the National Institute of Traumatology & Orthopaedic Rehabilitation (NITOR) and the Department of Orthopedic, Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, Bangladesh over 12 months from January 2022 to December 2022. A total of 100 patients diagnosed with lumbar disc prolapse based on clinical assessment and MRI findings were included and divided into two equal groups: 50 received conservative management (rest, analgesics, physiotherapy), and 50 underwent surgical intervention (discectomy or decompression). Inclusion criteria were patients aged 18–60 years presenting with low back pain with or without radiculopathy, confirmed disc prolapse on MRI. Patients with spinal trauma, tumors, infections, prior spine surgery, or caudaequina syndrome were excluded. Data on demographics, clinical features, MRI findings, Visual Analogue Scale (VAS) scores, and treatment outcomes were collected using a structured questionnaire. Follow-up was done at 3 months post-treatment. Statistical analysis was performed using SPSS version 25, with a p-value <0.05 considered statistically significant. Ethical approval was obtained from the

institutional review board, and informed written consent was taken from all participants.

RESULTS

Table 1: Demographic and Clinical Characteristics of Patients (N=100)

Variables	Conservative Group (n=50)	Surgical Group (n=50)	p-value
Mean Age (years)	42.6 ± 9.8	41.3 ± 8.7	0.42
Male: Female	32:18	34:16	0.68
Mean BMI (kg/m²)	26.1 ± 3.2	26.5 ± 2.9	0.51
Duration of Symptoms (weeks)	8.4 ± 2.1	10.1 ± 2.5	0.001*
Smoking History (%)	38%	42%	0.67
Labor-intensive Occupation	60%	64%	0.71

*Statistically significant

The mean age was similar between conservative (42.6 years) and surgical groups (41.3 years), as were BMI values (26.1 vs 26.5 kg/m²). Male patients were slightly more common in both groups (64% in conservative vs 68% in surgical). A significantly longer symptom duration was observed in the surgical group (10.1 weeks vs8.4 weeks; p=0.001), indicating a trend of delayed decision for surgery. Smoking and physically demanding jobs were reported in 38–42% and over 60% of both groups, respectively. [Table 1]

Table 2: Clinical Presentation of Patients (N=100)

Symptoms	Conservative Group (n=50)	Surgical Group (n=50)
Low back pain	100%	100%
Sciatica/radiculopathy	84%	92%
Numbness/tingling	60%	70%
Motor weakness	20%	32%
Caudaequina symptoms	0%	2%

All patients reported low back pain. Sciatica was more prevalent in the surgical group (92%) than in the conservative group (84%). Numbness and tingling were seen in 60% of conservative and 70% of surgical patients. Motor weakness was also more frequent in surgical cases (32% vs 20%), and 1 patient (2%) in the surgical group had early features of caudaequina syndrome, highlighting more severe neurological compromise among surgical candidates. [Table 2]

Table 3: MRI Findings – Levels and Types of Disc Herniation (N=100)

Parameters	Conservative Group (n=50)	Surgical Group (n=50)
L4–L5 level	29 (58%)	26 (52%)
L5–S1 level	17 (34%)	21 (42%)
L3–L4 level	4 (8%)	3 (6%)
Protrusion type	34 (68%)	21 (42%)
Extrusion type	16 (32%)	29 (58%)

The most frequently affected levels were L4–L5 (58% in conservative and 52% in surgical group) and L5–S1 (34% vs 42%). Disc extrusions were significantly more common in surgical patients (58% vs 32%), while disc protrusions were more prevalent in the conservative group (68% vs 42%). This suggests that more severe disc pathology on imaging was associated with surgical decision-making. [Table 3]

Table 4: Pain Assessment Using Visual Analogue Scale (VAS) (N=100)

Group	VAS Score (Pre-treatment)	VAS Score (Post-treatment)	Mean Change	p-value
Conservative (n=50)	7.6 ± 1.1	3.2 ± 1.4	−4.4	
Surgical (n=50)	8.1 ± 1.0	1.4 ± 0.9	−6.7	0.001*

*Statistically significant

The mean baseline VAS pain score was 7.6 in the conservative group and 8.1 in the surgical group, indicating moderate to severe pain at presentation. Following treatment, the mean VAS score dropped to 3.2 in the conservative group and to 1.4 in the surgical group. The average pain reduction was more pronounced in the surgical group (−6.7 vs −4.4; p=0.001), demonstrating faster and more substantial pain relief with surgical management. [Table 4]

Table 5: Complications and Recurrence at 3-Month Follow-up (N=100)

Complications	Conservative Group (n=50)	Surgical Group (n=50)
Recurrence of symptoms	5 (10%)	2 (4%)
Wound infection	0	3 (6%)
Transient nerve irritation	0	4 (8%)
Mean hospital stay (days)	0	3.4 ± 1.2

Symptom recurrence was observed in 10% of conservative and 4% of surgical patients. Among surgical cases, minor complications included wound infections in 3 (6%) and transient nerve irritation in 4 (8%) patients. The mean hospital stay post-surgery was 3.4 days. [Table 5]

DISCUSSION

This study evaluated and compared the clinical profiles and short-term outcomes of patients with lumbar disc prolapse (LDP) treated conservatively and surgically at a tertiary hospital in Bangladesh.[5] While both treatment arms demonstrated significant pain reduction, surgical management provided more rapid and substantial improvement. In our study, the mean age of patients was approximately 42 years in both groups, and 64–68% were male. This aligns with the findings by Islam *et al.*, where the mean age was 41.7 years and 65.1% were male, reflecting similar demographics in Bangladeshi spine clinics.[14] A male preponderance was also reported in the study by Mohammad *et al.*, where 67% of the 150 patients were male, most of whom were involved in labor-intensive occupations, consistent with our findings (60–64%).[4]The duration of symptoms before treatment in our study was longer in the surgical group (10.1 ± 2.5 weeks) compared to the conservative group (8.4 ± 2.1 weeks), a statistically significant difference (p=0.001). In Ahsan *et al.*'s 2022 study, the mean duration before surgery was even longer—14.2 weeks, suggesting that surgery is often reserved for patients with chronic or non-resolving symptoms.[15]

Clinically, all our patients had back pain, but sciatica was more common in the surgical group (92% vs 84%). Motor weakness was also more frequent in surgically treated patients (32% vs 20%). Bahadir *et al.* reported that 89.5% of surgical patients had radiculopathy and 28% had motor weakness, which aligns with our surgical group values.[16] Radiologically, disc extrusions were more common in surgical patients in our study (58% vs 32% in conservative). This trend is echoed in Casal-Moro *et al.*'s study, where patients with disc extrusions showed greater benefit from microdiscectomy compared to those with contained protrusions.[17] In their five-year follow-up, 78% of patients with extrusion had excellent outcomes after surgery.Regarding pain relief, our results demonstrated a greater drop in VAS scores in the surgical group (from 8.1 to 1.4; mean change −6.7) than in the conservative group (from 7.6 to 3.2; mean change −4.4), with p=0.001. This aligns with Weinstein *et al.* (SPORT Trial), where surgical patients had a VAS drop from 8.0 to 2.5 within 6 weeks, compared to 8.0 to 4.5 in non-operative cases (p<0.05).[18]

In a conservative cohort studied by Hossain *et al.*, VAS decreased from 7.3 to 3.6 after 3 months of supervised physiotherapy and analgesics, similar to our conservative outcome (VAS: 7.6 to 3.2).[19] In terms of recurrence and complications, our surgical group had a 4% recurrence, 6% wound infection, and 8% transient nerve irritation. In contrast, Khan *et al.* reported recurrence in 3.6%, infection in 4.8%, and transient neurological issues in 7.2% of 4000 cases—closely mirroring our surgical complication rates.[20] For conservative treatment, Chiu *et al.* found recurrence rates of 11–14%, which is comparable to our 10% recurrence in the conservative group.[9] Regarding hospital stay, our surgical patients stayed an average of 3.4 ± 1.2 days, which is slightly shorter than the 4.2-day average reported by Delta Medical College's experience.[21] This may reflect improvements in perioperative care and earlier discharge planning.

Limitations of The Study

The study was conducted at the National Institute of Traumatology & Orthopaedic Rehabilitation (NITOR) and in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study highlights that both conservative and surgical management strategies are effective in treating lumbar disc prolapse; however, surgical intervention offers significantly faster and greater pain relief, particularly in patients with prolonged symptoms, neurological deficits, and MRI-confirmed disc extrusion. While conservative treatment remains a valuable first-line option for less severe cases, the findings underscore the importance of individualized treatment planning based on clinical severity, duration of symptoms, and radiological features to optimize patient outcomes.

Recommendation

Based on the study findings, surgical management should be considered early in patients with severe pain, neurological deficits, or MRI evidence of disc extrusion who do not respond to initial conservative therapy. Conservative treatment may be appropriate for mild to moderate cases; however, regular follow-up is essential to identify those requiring surgical intervention. Treatment decisions should be individualized, balancing clinical severity, patient preferences, and resource availability.

Funding: No funding sources.
Conflict of interest: None declared.

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The Journal of Teachers Association
Abbreviated Key Title: TAJ
Official Journal of Teachers Association Rajshahi Medical College