Original Article

Assessment of Risk Factors and In-Hospital Outcomes of Management of Prolapse Lumbar Intervertebral Disc

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ABSTRACT

Introduction: *A prolapsed lumbar intervertebral disc, often referred to as a lumbar disc herniation or slipped disc, is a prevalent spinal condition characterized by the protrusion of the soft, gel-like center of a disc in the lumbar (lower back) region of the spine through a tear or weakened area in the disc's outer layer. This can result in adjacent nerve compression, leading to pain and other associated symptoms. Several factors can increase the probability of developing a PLID including age, occupation, obesity, smoking, inappropriate lifting techniques, trauma/injury, and degenerative disc disease.* ***Objective****: The main objective of our study is to evaluate the risk factors of PLID and their prevalence and best suitable surgical outcome.* ***Methods & Materials:*** *This cross-sectional observational study comprises 110 patients admitted to the orthopedic ward in holy family medical college hospital, Dhaka, Bangladesh from January 2022 to January 2023.* ***Results:*** *In our study, the majority of participants were male (29.09%) and aged between 38-47 years. The primary occupation of the participants was businessmen (43.64%). The primary factor identified in our study was trauma or injury, accounting for 65.45% of cases. Microdiscectomy was performed in 54.55% of patients, and infection emerged as the primary postoperative complication, affecting 35% of patients.*

Conclusion*: Adopting a balanced lifestyle, keeping to proper posture, and promptly seeking medical assistance for back pain or discomfort are crucial measures for minimizing the risk*

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and effectively managing the illness. Microdiscectomy is a surgical treatment that aims at reducing the symptoms caused by a prolapsed lumbar intervertebral disc, using a minimally invasive approach. When compared to traditional discectomy and fenestration, micro-discectomy resulted in a shorter length of stay in the hospital and a lower incidence of complications in a selected group of patients.

Keywords: *Risk Factors, PLID, Postoperative complication, Microdiscectomy*

INTRODUCTION

The intervertebral disc is composed of two main components: the inner nucleus pulposus and the outer annulus fibrosus. The central nucleus pulposus is responsible for secreting collagen and contains a large number of proteoglycans. These proteoglycans help retain water, which in turn creates hydrostatic pressure. This pressure is important for resisting the axial compression of the spine [1,2]

The nucleus pulposus consists mainly of type II collagen, which makes up 20% of its total dry weight. The annulus fibrosus is responsible for keeping the nucleus pulposus positioned at the center of the disc with minimal proteoglycans. It consists mainly of concentric type I collagen fibers, which make up 70% of its dry weight [1-4]

In lumbar disc herniation, the narrowing of the space around the thecal sac can occur due to three main factors: protrusion of the disc through an intact annulus fibrosus, extrusion of the nucleus pulposus through the annulus fibrosus while still maintaining continuity with the disc space or complete loss of continuity with the disc space and sequestration of a free fragment [5].

It may occur with sciatica, which causes weakness, tingling, numbness, or radiating pain down one leg. The ruptured disc compresses the sciatic nerve, which runs down the back of each leg. Foot or leg muscle weakness can impede balance and movement. Reflexes change, notably in the affected leg. An uncommon and severe prolapsed lumbar disc can compress bladder and bowel nerves, causing incontinence.

The natural process of aging matters. As people age, their spine's intervertebral discs may lose water, reducing flexibility and injury risk. Disc degeneration increases herniation risk. Spinal disc herniation can result from a car crash, fall, or improper lifting of heavy objects. Disc herniation can develop by regular bending, twisting, or lifting, especially with poor body mechanics. Risk factors include repetitive actions and lifting heavy objects at work or play. Extra weight, especially in the abdomen, can stress the lumbar spine and put additional force on the intervertebral discs, making them more likely to herniate. Smoking reduces disc blood flow, slowing recovery and increasing disc herniation risk.

Inadequate body alignment and ergonomics during everyday tasks, especially extended periods of sitting without appropriate support for the lower back, can progressively result in problems connected to the spinal discs.

Magnetic resonance imaging (MRI) is widely regarded as the most reliable imaging technique for confirming suspected lumbar disc herniation (LDH), with a diagnostic accuracy of 97% and high inter-observer reliability [6,7].

Non-operative treatment is the preferred approach for most patients with

symptomatic lumbar disc herniation (LDH). Gugliotta et al. found comparable outcomes in the medium- and long-term for conservative and surgical approaches in the treatment of lumbar disc herniation (LDH). Local corticosteroid injections (CSI) are frequently employed for both the diagnosis and treatment of lumbar disc herniation (LDH) [8].

A separate study assessed the impact of traction therapy on immediate results [9]. Conventional Western physical therapy (PT) methods, which involve exercises, core strengthening, and joint mobility, are effective in alleviating symptoms associated with lumbar disc herniation (LDH) [10].

Minimally invasive spine surgery techniques are linked to reduced soft tissue and bony damage, lower acute care costs, and shorter hospital stays. However, it is important to note that these approaches also require a steeper learning curve [11,12].

OBJECTIVE: The main objective of our study is to evaluate the risk factors of PLID and their prevalence and best suitable surgical outcome.

METHODS & MATERIALS

This study is a retrospective evaluation of 110 patients who were hospitalized in the orthopedic ward at Holy Family Medical College Hospital in Dhaka, Bangladesh, from January 2022 to January 2023.

Inclusion criteria

- Patient aged more than 18 years.
- Patient with lower back pain.
- Patient with radiculopathy.

Exclusion criteria

- Patient with intermittent claudication and peripheral arterial disease.

RESULTS

Table I presents the sociodemographic data of the study participants. The majority of cases (29.09%) were aged between 38-47 years. A significant proportion (24.55%) fell within the age range of 28-37 years. A smaller number of cases (14.54%) were aged between 58-67 years. There were an equal number of cases (10.91%) in the age ranges of 18-27 years and 68-77 years. Only a minority (10%) of cases were aged between 48-57 years. Out of the total number of cases, 77 (70%) were male and 33 (30%) were female. Out of the total 48 patients, the majority (43.64%) were businessmen, followed by individuals in service (28.18%), housewives (10.91%), and those in various other occupations (17.27%).

Table I: Socio-demographic profile of our study cases (n=110)

Socio-demographic factors	Prevalence	Percentage (%)
Age(years)		
18-27	12	10.91
28-37	27	24.55
38-47	32	29.09
48-57	11	10
58-67	16	14.54
68-77	12	10.91

Sex		
Male	77	70
Female	33	30
Occupation		
Businessman	48	43.64
Service	31	28.18
Housewife	12	10.91
Others	19	17.27

Figure-1 illustrates the etiology of the cases, with 72 cases (65.45%) having a history of trauma and the remaining 38 cases (34.55%) having causes other than trauma or injury.

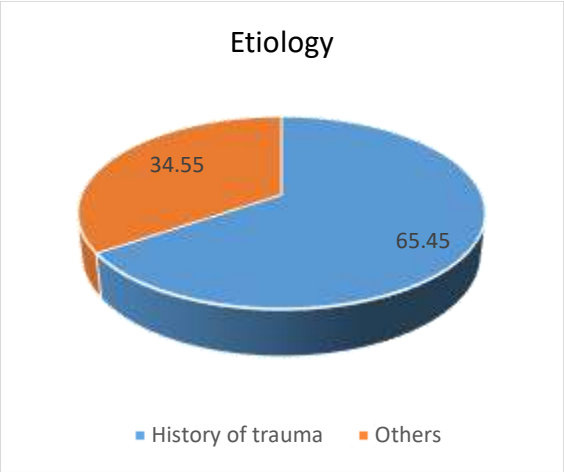

Figure-1: Common etiology of the study cases (n=110)

Figure-2 displays the standard procedures implemented in the study cases. Out of the total of 60 patients, the majority (54.55%) received micro-discectomy, while 23 patients (20.91%) experienced improvement solely through physiotherapy. Additionally, 18 patients (16.36%) underwent conventional discectomy and fenestration, while the remaining 9 patients (8.18%) opted for local corticosteroid injection.

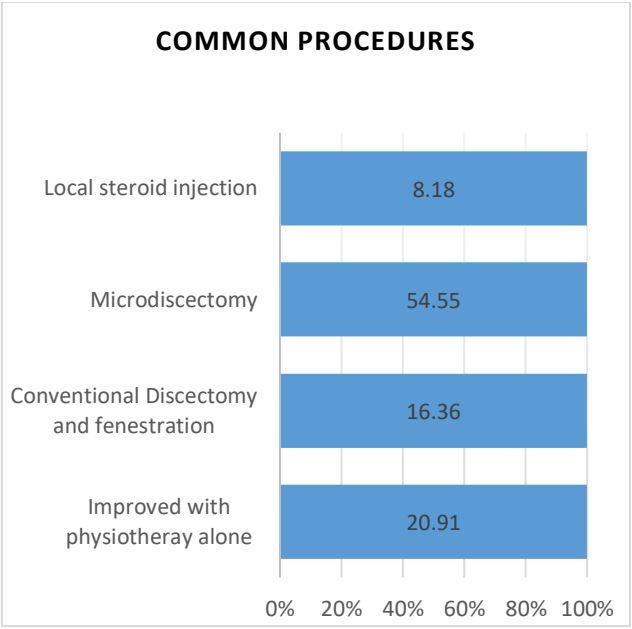

Figure-2: Common procedure applied to study cases (n=110)

Table II presents the postoperative complications. Out of the total 60 cases, the majority (36.67%) did not experience any post-operative complications. Infection occurred in 21 cases (35%), while worsening pain was observed in 7 cases (11.67%). Recurrent hernia was reported in 5 cases (8.33%), and dural tears occurred in 3 cases (5%). Nerve root injury was only observed in 2 cases (3.33%).

Table II: Post-operative complications of the study cases (n=60)

Post-operative complications	**Frequency**	**Percentage**
Dural tears	3	5
Infection	21	35
Worsening of pain	7	11.67
Nerve root injury	2	3.33
Recurrent hernia	5	8.33

No complications	22	36.67

DISCUSSION

This study provides the sociodemographic information of the participants. The largest proportion of cases (29.09%) fell within the age range of 38-47 years. Approximately a quarter (24.55%) of the participants were aged between 28 and 37 years. A minority of cases (14.54%) fell within the age range of 58-67 years. The proportion of cases was the same (10.91%) for individuals aged 18-27 years and 68-77 years. A small proportion (10%) of cases fell within the age range of 48-57 years.

Of the total cases, 77 (70%) were male and 33 (30%) were female. Among the 48 patients, the largest proportion (43.64%) consisted of businessmen. Individuals in service accounted for 28.18% of the patients, while housewives represented 10.91%. The remaining patients were engaged in various other occupations, making up 17.27% of the total.

Out of the total number of cases, 72 (65.45%) were associated with a history of trauma, while the remaining 38 cases (34.55%) had causes unrelated to trauma or injury.

Among the 60 patients, the majority (54.55%) underwent micro-discectomy, while 23 patients (20.91%) achieved improvement solely through physiotherapy. In addition, 18 patients (16.36%) underwent conventional discectomy and fenestration, while 9 patients (8.18%) chose local corticosteroid injection.

In a separate study, the authors reported a success rate of 62% for epidural steroid injections in 86 patients who did not respond adequately to conservative treatments [13].

Among the 60 cases analyzed, the majority (36.67%) did not exhibit any post-operative complications. Infection was present in 21 cases, accounting for 35% of the total. Additionally, worsening pain was observed in 7 cases, representing 11.67% of the total. The recurrent hernia was observed in 5 cases, accounting for 8.33% of the total, while Dural tears were documented in 3 cases, representing 5% of the sample. Nerve root injury occurred in only 2 cases, representing a prevalence of 3.33%.

The use of the micro-discectomy technique is effective in achieving both a high rate of patient satisfaction and functional recovery [14].

In a recent study, researchers found that using a microscope in fenestration discectomy for treating symptomatic lumbar disc herniation can achieve similar outcomes as open fenestration in terms of nerve root decompression and relief of leg pain. However, the use of a microscope has the advantage of reducing back pain, shortening hospital stays, and allowing for earlier return to daily activities. The main disadvantage is the higher cost associated with using a microscope [15].

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