OPEN ACCESS

Saudi Journal of Medical and Pharmaceutical Sciences

Abbreviated Key Title: Saudi J Med Pharm Sci
ISSN 2413-4929 (Print) | ISSN 2413-4910 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Clinical Characteristics and Surgical Outcomes of Upper Lumbar Disc Herniation: A Retrospective Study from a Tertiary Care Hospital in Bangladesh

Dr. Mohammed Abdul Awwal[1*], Dr. Jamal Uddin Ahmad[2], Dr. Tarannum Morshed[3]

[1]Assistant Professor Spine Surgery, Orthopaedic Surgery, BSM Medical University, Dhaka, Bangladesh
[2]Medical Officer, Department of Orthopedic, BSMMU, Dhaka, Bangladesh
[3]Junior Consultant, Radiology & Imaging Department, BIRDEM, Dhaka, Bangladesh

DOI: 10.36348/sjmps.2021.v07i12.006 | **Received:** 23.06.2021 | **Accepted:** 07.08.2021 | **Published:** 30.12.2021

***Corresponding author:** Dr. Mohammed Abdul Awwal

Abstract

Background: Upper lumbar disc herniation (ULDH), affecting the L1–L2 and L2–L3 levels, is relatively uncommon but often presents with atypical symptoms, making diagnosis and treatment challenging. Given its proximity to the conus medullaris and the narrower spinal canal in the upper lumbar region, even small disc herniations can produce significant neurological deficits. ***Aim:*** This study aimed to evaluate the clinical characteristics, surgical management, and outcomes of patients with ULDH treated at a tertiary care hospital in Bangladesh. ***Method:*** A retrospective review was conducted on 100 patients diagnosed with ULDH and treated surgically at a Tertiary Medical College Hospital in Bangladesh from January 2020 to December 2020. Patient data including demographics, presenting symptoms, radiological findings, surgical technique, and postoperative outcomes were analyzed. All patients underwent microdiscectomy or laminectomy based on clinical and radiological findings. Follow-up was conducted for six months postoperatively. ***Results:*** The mean age was 52.4 ± 11.6 years, with a male predominance (61%). Most patients presented with anterior thigh pain (78%), lower limb weakness (42%), and bladder dysfunction (12%). The most common disc level affected was L2–L3 (67%). Microdiscectomy yielded better recovery in patients with isolated disc herniation, while laminectomy was used for calcified or migrated discs. Significant improvement in VAS and ODI scores was noted postoperatively ($p < 0.001$). Only 5% of patients developed complications such as dural tear or superficial wound infection. ***Conclusion:*** ULDH, though rare, presents unique diagnostic and surgical challenges. Early surgical intervention tailored to the disc pathology results in favorable neurological and functional outcomes. Recognizing its atypical symptoms and imaging findings is crucial for timely and effective treatment.

Keywords: Upper lumbar disc herniation, Microdiscectomy, L2-L3 disc, Surgical outcomes, Bangladesh.

INTRODUCTION

Lumbar disc herniation is a common cause of lower back and leg pain; however, upper lumbar disc herniation (ULDH), particularly at L1–L2 and L2–L3 levels, is relatively rare, comprising only 1–11% of all lumbar disc herniations [1]. Unlike lower lumbar herniations, ULDH often presents with vague or atypical symptoms such as anterior thigh pain, groin numbness, and even bowel or bladder disturbances [2]. Due to the anatomical differences in the upper lumbar region—narrower spinal canal, conus medullaris proximity, and different nerve root orientation—ULDH poses unique diagnostic and therapeutic challenges [3].

The rarity of ULDH has led to a limited number of studies, particularly from developing countries, where delayed presentation and limited access to advanced imaging further complicate early diagnosis [4]. Moreover, surgical management varies depending on the location, size, and consistency of the herniation. Microdiscectomy and laminectomy are the most commonly employed techniques, often chosen based on surgeon preference and intraoperative findings [5].

The anatomical location in the upper lumbar region increases the risk of neurological injury, and untreated cases may result in irreversible deficits [6]. MRI remains the gold standard for diagnosis, yet interpretation can be difficult in cases of migrated or

sequestered fragments [7]. Clinical correlation is thus imperative to avoid misdiagnosis. Early surgical decompression has been shown to provide symptomatic relief and functional improvement in properly selected patients [8].

In Bangladesh, spine surgery is evolving with improved access to imaging and surgical expertise. However, data on ULDH in the local context are sparse. This study aims to bridge that gap by analyzing clinical presentation, imaging findings, surgical strategies, and patient outcomes in a cohort from a tertiary care hospital [9]. The results are expected to contribute to regional guidelines for managing this under-reported but clinically significant pathology [10].

Objective

The objective of this study was to evaluate the clinical features and surgical outcomes of patients with upper lumbar disc herniation (ULDH) undergoing operative management in a tertiary care hospital in Bangladesh.

METHODOLOGY

Study Design and Setting

This was a retrospective observational study conducted at the Department of Neurosurgery, Tertiary Medical College Hospital, Bangladesh, from January 2020 to December 2020.

Sample Size

A total of 100 patients with radiologically confirmed ULDH (L1–L2 or L2–L3 levels) who underwent surgical intervention were included. Inclusion criteria comprised adults aged 18–75 years, presence of neurological symptoms, and failure of conservative therapy for at least six weeks.

Selection criteria

Inclusion Criteria

1. Diagnosed with upper lumbar disc herniation
2. Presented with clinical symptoms consistent with nerve root
3. Underwent surgical intervention for upper lumbar disc herniation
4. Provided complete medical records and preoperative imaging necessary for retrospective analysis.
5. Age between 18 and 70 years.

Exclusion Criteria

1. Lumbar disc herniation at levels below L2–L3
2. History of previous lumbar spine surgery
3. Presence of spinal tumors, infections (e.g., tuberculosis), or traumatic spinal injuries,
4. Congenital spinal deformities
5. Systemic neurological disorders

Data Collection

Data were collected from hospital records and surgical databases. Parameters included demographic data, presenting complaints, neurological status, MRI findings, surgical technique, complications, and functional outcomes.

Surgical Procedure

Patients underwent either microdiscectomy or laminectomy, depending on the disc's morphology. Intraoperative findings and need for instrumentation were noted.

Outcome Measures

Postoperative outcomes were evaluated using:

- Visual Analog Scale (VAS) for pain,
- Oswestry Disability Index (ODI),
- Neurological status,
- Complication rates.

Follow-up was conducted at 1, 3, and 6 months postoperatively.

Statistical Analysis

Data were analyzed using SPSS version 25. Continuous variables were expressed as mean ± standard deviation, and categorical variables as percentages. Comparative analysis was performed using chi-square test for categorical variables and t-test for continuous variables. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic and Clinical Characteristics

Parameter	Value
Mean age (years)	52.4 ± 11.6
Male:Female ratio	61:39
Common presenting symptom	Anterior thigh pain (78%)
Neurological deficit	Present in 42%
Bladder involvement	12%

The patient cohort showed a male predominance with a mean age of early 50s. Most common symptom was anterior thigh pain, often misdiagnosed as hip or abdominal pathology.

Table 2: Distribution of Disc Herniation Levels

Disc Level	Number of Patients	Percentage (%)
L1–L2	33	33%
L2–L3	67	67%

The majority of cases were localized at the L2–L3 level, aligning with global trends where this level is more prone due to transitional biomechanics of the upper lumbar spine.

Table 3: Surgical Techniques and Complications

Technique	Number of Patients	Complication Rate (%)
Microdiscectomy	72	2.7%
Laminectomy	28	10.7%

Microdiscectomy was the preferred technique with fewer complications. Laminectomy was used in complex cases, showing a slightly higher complication rate, mostly dural tears.

Table 4: Pain and Disability Scores

Outcome Measure	Pre-op Mean ± SD	Post-op Mean ± SD (6 mo)	p-value
VAS	7.6 ± 1.2	2.1 ± 1.1	<0.001
ODI (%)	61.5 ± 9.4	22.8 ± 6.7	<0.001

Significant reduction in pain and disability was observed at six months postoperatively. Most patients experienced substantial functional improvement.

Table 5: Neurological Recovery

Recovery Status	Number of Patients	Percentage (%)
Full recovery	82	82%
Partial improvement	14	14%
No improvement	4	4%

A large proportion of patients achieved complete neurological recovery. Only a few had persistent deficits, mostly those with delayed surgical intervention or severe pre-op compression.

DISCUSSION

Upper lumbar disc herniation poses diagnostic and surgical challenges due to its rarity and atypical presentation. Most patients in our study presented with anterior thigh pain and proximal leg weakness, consistent with findings from previous studies [5-7]. The high proportion of L2–L3 level herniations aligns with biomechanical stress distribution at this transition zone of the spine [1].

Surgical intervention, especially microdiscectomy, showed excellent outcomes in symptom resolution and functional improvement. These results are consistent with international studies showing microdiscectomy as a safe and effective technique for ULDH [8]. The slightly higher complication rate in laminectomy cases may be attributed to more complex pathologies such as calcified discs or migrated fragments [9].

Functional outcomes were significantly better postoperatively, as evident from improvements in VAS and ODI scores, validating the role of early surgical intervention. Similar trends were reported in other retrospective and prospective studies [10]. Importantly, timely diagnosis through MRI and a tailored surgical approach based on individual anatomy were key determinants of positive outcomes [11-13].

The rarity of ULDH often leads to misdiagnosis or delay in referral. In our cohort, nearly 40% of patients had seen multiple specialists before reaching a neurosurgeon. This highlights the need for greater awareness among primary care physicians and orthopedists [14-16].

This study is one of the few from Bangladesh focusing exclusively on ULDH, and it provides valuable local data that can be used to inform clinical practice. The limitations include its retrospective nature, single-center scope, and relatively short follow-up period [17-20].

CONCLUSION

Upper lumbar disc herniation, though less frequent than lower lumbar pathologies, demands high clinical suspicion due to its variable presentation. Early diagnosis and surgical intervention, especially with microdiscectomy, lead to favorable outcomes with

minimal complications. Increased awareness and access to MRI can significantly improve the diagnostic timeline. Our findings support the adoption of individualized surgical strategies based on disc morphology and patient presentation to optimize recovery.

REFERENCES

1. Benoist M. Natural history of the lumbar spine. Joint Bone Spine. 2002;69(5):386–390.
2. Guigui P, Benoist M, Deburge A. The value of clinical signs in the diagnosis of upper lumbar disc herniations. Spine. 1994;19(4):445–448.
3. Ahn UM, Ahn NU, Buchowski JM, *et al.,* Cauda equina syndrome secondary to lumbar disc herniation: a meta-analysis of surgical outcomes. Spine. 2000;25(12):1515–1522.
4. Kim KJ, Lee SH, *et al.,* Surgical treatment of upper lumbar disc herniation. J Korean Neurosurg Soc. 2006;39:344–348.
5. Hsu KY, Zucherman JF, Shea WJ, Kaiser JA. High lumbar disc herniations. Spine. 1990;15(7):679–682.
6. Wang H, Huang B, Li C, *et al.,* Surgical management of upper lumbar disc herniation: a retrospective study. Eur Spine J. 2013;22(2):287–291.
7. Ishimoto Y, *et al.,* Prevalence and characteristics of upper lumbar disc herniation in the Japanese population. Spine. 2012;37(14):E849–E856.
8. Matsumoto M, Chiba K, Toyama Y. Surgical outcomes of upper lumbar disc herniations. Spine. 1999;24(15):1583–1587.
9. Kawakami M, Tamaki T, *et al.,* An analysis of clinical symptoms and surgical outcomes in upper lumbar disc herniation. Spine J. 2001;1(4):273–277.
10. Weiner BK, Fraser RD. Spine update: lumbar disc herniation. Spine. 1999;24(18):1974–1980.
11. Fujiwara A, *et al.,* MRI of upper lumbar disc herniation. J Orthop Sci. 2000;5(2):137–142.
12. Sucu HK, Gelal F. Lumbar herniated disc mimicking hip pathology. J Neurosurg Spine. 2006;5(6):557–560.
13. Youkilis AS, *et al.,* Surgical strategies for high lumbar disc herniation. Neurosurg Focus. 2004;16(1):E5.
14. Debnath UK, *et al.,* Missed diagnosis of upper lumbar disc. Bangladesh Med Res Counc Bull. 2018;44(2):105–110.
15. Rahman MM, *et al.,* Challenges in diagnosing lumbar disc diseases. J Bangladesh Coll Phys Surg. 2019;37(4):165–170.
16. Bhuiyan MAH, *et al.,* Prevalence and treatment outcomes of lumbar disc herniation in Bangladesh. Bangladesh J Neurosurg. 2020;9(1):15–21.
17. Epstein NE. The surgical management of lumbar disc disease. Spine J. 2002;2(3):205–214.
18. Haq MM, *et al.,* Spinal disorders in low-income countries: perspectives from Bangladesh. J Spine. 2021;10(3):487–494.
19. Al-Khawaja D, *et al.,* Surgical outcomes of high lumbar herniations. Eur Spine J. 2014;23(6):1221–1225.
20. Deyo RA, Mirza SK. Trends in the care of back pain. J Bone Joint Surg Am. 2006;88(1):21–24.