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Bilateral Lumbar Micro-Foraminotomy and Micro-Discectomy with 18 Months Postoperative Follow-Up: A Series of 27 Cases

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Abstract

Background: Bilateral lumbar micro foraminotomy and bilateral micro-discectomy is considered as a gold standard surgical technique for the treatment of patients with lumbar disc hernia (LDH) with lateral recess stenosis (LRS) although various types of treatment are being developed. **Objective:** This study aimed to investigate the safety and efficacy of bilateral lumbar micro-foraminotomy and bilateral micro-discectomy for the treatment of patients with lumbar disc hernia (LDH). **Methodology:** This was a retrospective cohort study conducted in the Department of Neurosurgery & Neuro-ICU at Enam Medical College & Hospital, Savar, Dhaka during the period of January 2019 to December 2020. All data were collected from patient files. Data were collected pre-designed data collection sheet. **Results:** This study shows shows maximum (48.1%) were 41 to 50 years followed by 37.0% were 31 to 40 years and 14.8% were 20 to 30 years. The average age was 39.66±9.25 years. Majority (77.8%) were male and 22.2% cases were female. The most common levels affected by soft disc prolapse recess stenosis are L4-5 and L5-S1 segments. This study shows the mean Oswestry Disability Index (ODI) were 76.11±12.81 in preoperative and 5.00±7.72 postoperative. The decrease in values has been found to be significant in preoperative and postoperative (P<0.001). Study found only 3.7% was complications. **Conclusion:** Bilateral lumbar micro foraminotomy and bilateral micro-discectomy is an effective and safe method in the treatment of soft disc prolapse with lateral recess stenosis as it has low complication rates. *[Journal of National Institute of Neurosciences Bangladesh, January 2024;10(1):17-20]*

Keywords: Bilateral Lumbar; Micro-Foraminotomy, Discectomy; Postoperative

Introduction

The microdiscectomy is usually more effective for relieving leg pain (also known as radiculopathy, or sciatica) than lower back pain[1]. Low back pain is a very common condition in societies. About 60.0% to 80.0% of people suffer from low back pain and 35.0% experience sciatica pain at least once throughout their lives. Surgical intervention may be required in 10.0% of patients with lumbar disc hernia (LDH). Therefore, low back pain and LDH is a major problem for the community. Pain caused by LDH usually generally heals over six weeks with medical and physical therapy. Epidural steroid injections

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can be tried for pain. Severe and long-lasting pain, neurological deficit and patient preferences may require surgery. Surgical treatment has been reported to be more beneficial than conservative treatment in patients with severe symptoms with neurodeficit[2,3].

One of these techniques is lumbar microdiscectomy (LMD). This method, which has been used for many years, is the surgical removal of the damaged portion of a herniated disc causing pressure on the nerve root under the microscope. In recent years, nerve surgeons have gained great experience in this method. Satisfactory outcomes have been obtained in 60.0% to 80.0% cases of patients after LMD[4,5]. The aim of this study was to evaluate bilateral lumbar micro-foraminotomy and bilateral micro-discectomy in prolapsed lumber intervertebral disc with radiculopathy.

Methodology

Study Settings and Population: This was a retrospective cohort study conducted in the Department of Neurosurgery & Neuro-ICU at Enam Medical College & Hospital, Savar, Dhaka during the period of January 2019 to December 2020. 27 patients who met the selection criteria were included in this study.

Study Procedure: All data were collected from patient files. The study included those patients who fulfill the selection criteria. All the adult patients who suffered from soft disc prolapse with or without lateral recess stenosis and whose informed consent was obtained were included in this study. Patients with preoperative spondylolisthesis, spondylodiscitis, lumbar spinal fixation, lumbar spinal tumor, lumbar central canal stenosis were excluded. Diagnosis was done using clinical examinations, preoperative MRI of Lumbar spine and X-Ray Lumbo-Sacral Spine A/P & Lateral view standing. Standard micro surgical bilateral micro lumbar decompression and micro-foraminotomy was done in every cases. Post operative out come measured with Oswestry Disability Index (ODI) and compared with preoperative ODI.

Statistical Analysis: Data were analyzed using computer based program statistical package for social science (SPSS) for windows version 25.0 software.

Ethical Consideration: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration 2013) and also with the ethical guidelines of the Institutional research ethics. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and were analyzed using the coding system.

Results

Total 27 patients were included in this study and most of them were male which was 77.8% cases. Common age group was between age 41 to 50 years (Table 1).

Table 1: Demographic Characteristics of the Study Subjects (n=27)

Characteristics	Frequency	Percent
Age Group		
• 20 to 30 Years	4	14.8
• 31 to 40 Years	10	37.0
• 41 to 50 Years	13	48.1
Mean±SD	39.66±9.25	
Gender		
• Male	21	77.8
• Female	6	22.1

Common complaints of the study subjects were listed which was showing that sciatica was the most commonly occurring problem (Table 2).

Table 2: Complaints of the Study Subjects (n=27)

Complaints	Frequency	Percent
Sciatica	12	44.4
Rt tingling sensation	2	7.4
Cauda equina syndrome	9	33.3
Retention of Urine	3	11.1
Urine Bilateral Foot drop	3	11.1
Ankle jerks diminished	5	18.5
LBP Rt sciatica Rt foot drop	3	11.1
Neurogenic claudication	2	7.4
Toe walking not possible in rt	2	7.4
Power Rt- 4/5, Lt 5/5	1	3.7
RTA	1	3.7
Heel walking difficult	1	3.7
Sensory decreased in Rt S1	1	3.7
Lt sciatica and Femorica	1	3.7
L5 rediculopathy	1	3.7

In this study L4-5 level was the most commonly occurring level of herniated lumbar disc (Table 3).

Table 3 : Pre-operative diagnosis of the study subjects (n=27)

Pre-operative diagnosis	Frequency	Percent
L1-2	2	7.4
L2-3	2	7.4
L3-4	12	44.4
L4-5	17	63.0
L5-S1	9	33.3

Patients preoperative clinical condition and post-operative outcomes measured with ODI shown which was revealing significant improvement of the patients postoperatively (Table 4).

Table 4: Oswestry Disability Index In Pre and Postoperative

Operative State	ODI (Mean±SD)	P value
Preoperative	76.11±12.81	
Postoperative	5.00±7.72	0.001

In this study, only one complication was reported; unfortunately, the patient did not control her diabetes postoperatively after discharge most probably this was the cause of her discitis (Table 5).

Table 5: Complication of the study subjects (n=27)

Complication	Frequency	Percent
Yes (Discitis)	1	3.7
No	26	96.3
Total	**27**	**100.0**

Discussion

Standard microdiscectomy is still used as a gold standard in the treatment of lumbar disc hernia (LDH) with minor changes in surgical technique. In recent years, some studies have reported successful results with micro endoscopic discectomy (MED). However, its superiority to LMD has not been proved yet[6].

This study shows maximum (48.1%) were 41 to 50 years followed by 37.0% were 31 to 40 years and 14.8% were 20 to 30 years. These results were in alignment with the findings reported in the literature[5-7]. Another study Bulut et al[8] reported most commonly observed in the age group of 30 to 49 years (61.35%).

This study found majority (77.8%) were male and 22.2% cases were female. Similar study Ozger et al[4] found that 53.3% cases were male and 46.7% cases were female. Another study Bulut et al[8] found that maximum (55.67%) were female and 44.33% were male.

The most common levels affected by soft disc prolapse recess stenosis are L4-5 and L5-S1 segments. In a recent study reported to be L4-5 in 84 (55.3%) of 152 patients. In the present study, L4-5 level is the most common level undergoing soft disc prolapse with or without lateral recess stenosis with a rate of 46.33% cases[9]. Previous studies reported mostly seen at the intervertebral disc levels of L4-5 or L5-S1 due to the impact of biomechanical effects on the lumbar spinal column with a frequency of 80 to 90% in the literature[10-11].

This study shows the mean Oswestry Disability Index (ODI) were 76.11±12.81 in preoperative and 5.00±7.72 postoperative. The decrease in values has been found to be significant in preoperative and postoperative ($P<0.001$). Similar study Ozger et al4 reported the mean ODI (%) score has been reported to be 63.1±22.3 and 18.2±15.4 before and after the surgery, respectively.

The study found only 3.7% was complications. The incidence of complication of is reported to be around 0.1 to 18.8% by many different authors[12-13]. In a study conducted in 2017, where LMD was performed in 177 LDH patients, recurrent LDH developed in 30(16.0%) patients and 27 of these patients were re-operated[14]. The rate of patients who underwent reoperation due to recurrent disc herniation was in 15.25% cases[15].

In this study, the rate of recurrent was 0 which was lower than in the literature[12,13]. This low rate is probably due to our increased experience in LMD.

Conclusion

In this study shows ODI index were significantly decrease of postoperatively. Bilateral Micro-Foraminotomy and Bilateral Micro-Discectomy is still an effective and safe treatment option for suitable patients with soft disc prolapse with lateral recess stenosis and complication rates are low.

List of Abbreviation:
LDH: lumbar disc hernia
LRS: Lateral recess stenosis
SPSS: statistical package for social science
LMD: Lumbar microdiscectomy
LMM: Lumbar micro foraminotomy
MED: microendoscopic discectomy
LDH: Lumbar disc herniation

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KS, Khan MAM, Ahmed MI involved in the manuscript review and editing. All authors read and approved the final manuscript.

Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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References

1. Lang SS, Chen HI, Koch MJ, Kurash L, McGill-Armento KR, Palella JM, Stein SC, Malhotra NR. Development of an outpatient protocol for lumbar discectomy: our institutional experience. World Neurosurg. 2014;82(5):897-901.
2. Dey PC, Nanda SN. Functional Outcome after Endoscopic Lumbar Discectomy by Destandau's Technique: A Prospective Study of 614 Patients. Asian Spine J 2019;13:786-92.
3. Gelalis ID, Papanastasiou EI, Pakos EE. Clinical outcomes after lumbar spine microdiscectomy: a 5-year follow-up prospective study in 100 patients. Eur J Orthop Surg Traumatol 2019;29:321-7.
4. Ozger O, Kaplan N. Evaluation of clinical outcomes of 271 patients undergoing lumbar microdiscectomy in the light of literature. Annals of Medical Research 2020;27(2):664-9
5. Eugene J, Kim DH. A prospective analysis of magnetic resonance imaging findings in patients with sciatica and LDH. Spine 1997; 22:1650-60.
6. Rastecchini F. Results of surgery compared with conservative management for lumbar disc herniations. Spine 1991;21:1383-7.
7. Yasuma T, Arai K, Yamauchi Y. The histology of lumbar intervertebral disc herniations. Spine 1993;18:1761-5.
8. Bulut G, Hamit Aytar MH, Güdük M. Microsurgical treatment of lumbar disc herniation: a retrospective review of 282 cases. J Turk Spinal Surg 2019;30(4):240-4
9. Ahn Y, Lee SG, Son S. Transforaminal Endoscopic Lumbar Discectomy Versus Open Lumbar Microdiscectomy: A Comparative Cohort Study with a 5-Year Follow-Up. Pain Physician 2019; 22: 295-304.
10. Herthoff KD, Burton CV. CT evaluation of the failed back surgery syndrome. Orthop Clin North Am 2015; 16:417-4.
11. Weır BKA. Prospective study of 100 lumbosacral discectomies. J Neurosurgery 2009; 50:287-9.
12. Lee DY, Shim CS, Ahn Y. Comparison of percutaneous endoscopic lumbar discectomy and open lumbar microdiscectomy for recurrent disc herniation. J Korean Neurosurgery Soc 2009; 46:515-21
13. Camino Willhuber G, Kido G. Factors associated with lumbar disc hernia recurrence after microdiscectomy. Rev Esp Cir Ortop Traumatol 2017;61:397-403
14. Tzaan W. Transforaminal percutaneous endoscopic lumbar discectomy. Chang Gung Med J 2007;30: 226-34
15. Galarza M, Gazzeri R, De la Rosa P. Microdiscectomy with and without insertion of interspinous device for herniated disc at the L5–S1 level. J Clin Neurosci 2014;21:1934-9