Original Article

Functional Outcome of Micro Lumbar Discectomy in patients with Symptomatic Lumbar Disc Herniation

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ABSTRACT

Introduction: Lumbar disc herniation is a common cause of back and leg pain. Though the majority of symptomatic lumbar discs can be conservatively treated, surgical decompression is indicated in a subset of patients. Micro lumbar discectomy provides excellent results in the short-term period with relief of leg pain and early return to work.

Methods: This is a Retrospective study of 70 patients who underwent micro lumbar discectomy for symptomatic lumbar disc herniation with leg pain, straight leg raising test positive, MRI evidence of disc herniation, and failed conservative treatment of minimum 2 months duration. Patients with cauda equina, profound neurological deficits, multiple disc herniation, and previous lumbar spine surgery were excluded. All patients were surgically managed at National Trauma Centre, Kathmandu, Nepal, and had a minimum follow-up of 2 years

Results: A total of 70 patients were treated with Micro lumbar discectomy Out of these, 40 (57.1%) cases were male, and 30 (42.9%) were female. The commonest level involved was l4/l5 (35%) followed by (14%) l5/S1

Conclusion: Functional outcome of micro lumbar discectomy produces excellent results and is still a standard surgical technique for symptomatic lumbar disc herniation with minimum resources and low postoperative complications

Key Words: *Micro lumber discectomy, Lumber spine, Back pain*

Introduction

Lumbar disc herniation (LDH) is a common cause of back and leg pain. Symptomatic lumbar disc herniation is herniated disc in the spine is a condition during which a nucleus pulposus is displaced from intervertebral space causing back pain and neurological features like radiation, and claudication.[1] It occurs due to the degeneration of the intervertebral disc with subsequent prolapse of the nucleus pulposus through a defect in the annulus fibrous. Lumbar disc herniation occurs in 35% of men and 45% of women.[2] It also forms the second most common cause for medically authorized absence from work, The first lumbar disc surgery was done by Dandy in 1929.[3] Since then various operative procedures have been performed in disc surgery. Conservative treatment gives satisfactory results with disc herniation in the few months of treatment onset. This is likely to occur particularly in patients with mild or moderate nerve root compression. Surgical treatments give significantly faster and more satisfactory results. Some surgical complications were noted and chances of recurrences of radicular and low back pain Herniated lumbar disc is a displacement of the disc material. A herniated intervertebral disc is a disease that is the main cause of sciatica and severe low back pain

Conservative treatment with medicine, physiotherapy, epidural injection, and selective nerve root block are the modalities of treatment. Failure to which or severity of disease ends up with surgical management. There are two modalities of surgical management for disc herniation one is conventional and other one is a microdiscectomy.[4]

Conventional disc herniation surgery has a large incision size, as well as the bulk of tissue injury with prolonged

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surgical time, might have complications like severe pain, high rate of surgical site infection as well as a high rate of Dural tear and nerve injury. Micro lumbar discectomy, the small incision as well less soft tissue injury with lesser surgical time seems to have better post-operative pain relief as well as Minimal operative soft tissue injuries and infections, fewer hospital stays and early return to daily work.[5]

Thus the rationale of this study is to see the outcomes of micro disc herniation which might result in a change in the practice of the spine surgeon if the outcome will be similar to the other studies done in other parts of the world. Furthermore, This technique might help surgeons for better patient management for post-operative pain and other functional outcomes as well as infections.

Methods

A prospective observational study was conducted on patients with lumbar disc herniation presented at the national trauma center over a period of two years. A total of 70 cases participated in the study using the census method. Approval of the study was taken from the Institutional Review Board NAMS, Bir Hospital.

Quantitative data will be expressed as mean and standard deviation, whereas categorical variables will be presented as numbers and percentages. Quantitative data will be analyzed using an independent t-test. The chi-square test will be used to compare the sex preoperative and postoperative motor and sensory, Duration of motor and sensory. A P value>0.05 will be considered statistically significant.

After approval of IRB. Patient attending OPD who has symptoms of disc herniation like back pain claudication as well as leg pain and numbness and tingling sensation as well as failed conservative management patient counsel for disc herniation surgery by any spine surgeon of the unit. Once the confirmation of surgery is done based on the discretion of the operating surgeon either micro or conventional lumbar discectomy will be planned. Researchers will counsel those patients who are planning for microdiscectomy patients for observation research, after the consent from the patient researcher will do observations. Surgery will be done by a senior consultant spine surgeon.

Observation will be done for the patient who has symptomatic lumbar disc herniation requiring surgical intervention attending in trauma OPD. The following symptoms are observed preoperatively, and patient demographic profiles like age sex, Duration of illness as well as preoperative sensory and motor function will be assessed via MRC (Medical Research Council) Muscle Power grading. After completion of all the preoperative investigations and radiological images, the patient planned for surgery. As per institutional protocol, most of the patients are going for micro lumbar discectomy in our center. After general anesthesia, the position of the patients will be prone, and using the posterior midline approach opening the ligamentum flavum, hemilaminectomy, foraminotomy, and microdiscectomy will be performed. Nerve root release and herniated disc resection will be done. The aponeurosis, subcutaneous fascia, and skin will be closed. In these studies, Data will be collected by surgeons. In the post-operative ward pain assessment will be done by VAS scale and categorized into no pain, mild, moderate, and severe pain then the number of patients in each group will be recorded. The neurological function of the patient will be assessed via ASIA chart in the post-operative ward once the effect of the anesthesia is over. During the hospital stay, patients will be assessed and recorded if signs of infection will be found. Patients will be kept in follow-up weekly for a 6-month period and work performance as well as ease will be documented based on the Macnab criteria.

Macnab Criteria[13]

Excellent(1)	No pain no restriction of mobility, returns to work original level of activity
Good (2)	Occasional nonradicular pain, return to modified work
Fair(3)	Some improved functional capacity, still handicapped unemployed
Poor(4)	Continued objective symptoms of root involvement, additional operative intervention needed at the index level

Results

A total of 70 patients were treated with Micro lumbar discectomy Out of these, 40 (57.1%) cases were male, and 30 (42.9%) were female.

Age in years (Mean + SD) Min-Max 40.06% +11.22%(20-64) of the patient was around 40 ranged from 20 to 64 years. as in Figure 1

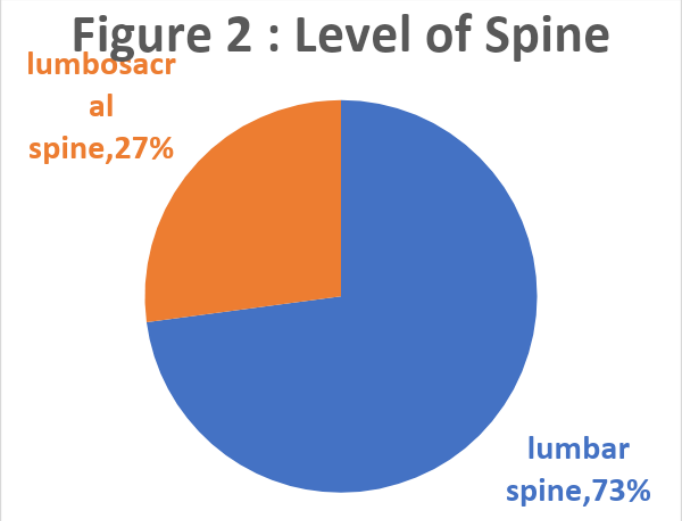

Fig 2: Level of Spine

The majority of the cases were lumbar spine 73% followed by lumbosacral spine 27% as shown in Figure 2.

Table 2: Neurology of cases

Neurology	Number	Percentage
Intact	31	44.28
Left leg pain	8	11.4
Right leg pain	10	14.28
Left leg Radiculopathy	4	5.71
Right leg Radiculopathy	6	8.57
Others	12	17.14

Table 3: Surgery performed

Surgery name	Right	Left
L4L5 MLD	4	17
L5S1 MLD	19	9

Table 4: Diagnosis of cases

Diagnosis	Frequency (n)	Percentage (%)
L4L5 PIVD with Rt L5 root compression	1	1.43
L4L5 stenosis with left leg radiculopathy	1	1.43
L5S1 PIVD Right Paracentral	1	1.43
Left L4L5 PIVD with Rt foot drop	1	1.43
Left L5S1 PIVD with sequestration	1	1.43
Left L5S1 sequestrated and inferiorly migrated disc	1	1.43
Lt L4L5 PIVD and NF stenosis	1	1.43
Lt paracentral PIVD	24	34.29
Lt stenosis with left leg radiculopathy	5	7.14
PIVD L4L5 with Rt L5 radiculopathy	1	1.43
PIVD L4L5 with Left L5 radiculopathy	1	1.43
Recurrent Right L5S1 PIVD	1	1.43
Right L3L4 PIVD with Rt L4 root compression	1	1.43
Rt L4L5 inferiorly migrated disc with Rt L5 root compression	1	1.43
Rt L4L5 PIVD with Rt L5 root compression	1	1.43
Rt Paracentral PIVD	22	31.43
Rt Stenosis with Rt. leg radiculopathy	6	8.57

About two third of the cases were diagnosed with paracentral PIVD of total cases. Stenosis with leg radiculopathy was found in 11 (16% cases).

Table 5: The mean difference of VAS score Pre-Operative and Post Operatively

	Time Duration	N	Mean Differences	SD	P-value
VAS for pain	Preoperatively	70	8.76	0.88	
	1 week postoperatively	70	4.76	0.44	<0.001
	3 months postoperatively	70	1.85	0.43	<0.001
	6 months postoperatively	70	0.89	0.24	<0.001
	One year postoperatively	70	0.50	0.22	<0.01
	Two years postoperatively	65	0.40	0.36	<0.01

We performed a paired T-test to see if the postoperative pain is reduced significantly as in Table 5. The post-operative VAS score is reduced significantly after one-year follow-up.

Table 6: Modified Macnab criteria for the assessment of clinical outcomes after Microlumbar Discectomy.

Outcome	No (%)
Excellent	41(58.57)
Good	26 (37.14)
Fair	3 (4.28)
Poor	0
Total	70

As per table 6. About 60 percent of total cases had excellent outcome followed by good as per Macnab criteria. There were no single cases of poor outcome.

Discussion

The aim of this study was to analyze the Functional outcome of patients undergoing micro disc herniation surgery for symptomatic lumbar disc herniation over the study period.

In our study, a total of 70 patients were treated with Micro lumbar discectomy out of these, 40 (57.1%) cases were male, and 30 (42.9%) were female. Age in years (Mean + SD) Min-Max 40.06% +11.22% (20-64) of patients was around 40 ranging from 20 to 64 years. Our study was similar to the study done by Bartlomiej K[6] where there were 149 male and 137 Female patients. In another study which is close to our study done by Yadav RM[10] the total number of 31 patients. Out of 31 patients, 19 were male and 12 were female with a mean age of 35 years.

our study showed the most commonly involved level was l4/l5 vertebrae and followed by L5/S1 Which was similar to the study done by Kaushal P[7] et al which was a prospective study of 220 cases in a period of 8 years in patients who underwent mini discectomy. In their study they found that the commonest level involved was L4/L5 followed by L5/S1 vertebrae which was comparable to our study.

In our study, the VAS score is 90%. A similar study was done by Sedighi [11] They evaluated 148 patients who had an operation for lumbar disc herniation. In their study, they concluded that the VAS score was 93.3%.

In our study, according to Modified, Macnab's Criteria were excellent in 41 cases, good in 26, and fair in 3 cases. The study which was close to our study done by Yadav RM.[10] They concluded that the final follow-up Modified Macnab's Criteria was excellent in 13 cases, good in 16, and fair in 2 cases. Their study concluded that removal of the herniated disc to decompress the nerve root provides rapid relief of symptoms and improved quality of life and early return to work.

Conclusion

Functional outcome of micro lumbar discectomy produces excellent results and still a standard surgical technique for symptomatic lumbar disc herniation with minimum resources and low postoperative complications

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