

# A prospective study of outcome of surgical management of patients presenting with lumbar disc herniation by open discectomy

<sup>1</sup>Dr. Manoj Kumar Ramachandraiah, <sup>2</sup>Dr. Ravi Kumar Naganur

<sup>1</sup>Fellow in Spine Surgery, Manipal Hospital, Old Airport Road, Bangalore, Karnataka, India

<sup>2</sup>Associate Professor, Department of Orthopedics, GIMS, Gadag, Karnataka, India

**Corresponding Author:** Dr. Ravi Kumar Naganur

## Abstract

Lumbar intervertebral disc herniation is one of the main causes of low back ache and sciatica, which might incapacitate a person. There are many techniques available for treating lumbar disc herniation. But conventional standard open discectomy is still the most acceptable method today. Numerous retrospective and some prospective reviews of open disc surgeries are available. These studies have reported excellent results in 46 to 97% of the patients. 30 Cases of lumbar disc herniation which have been treated by open discectomy, satisfying inclusion and exclusion criterias, admitted in Hospital were studied. Preoperative and postoperative scores were taken and the rate of improvement in terms of percentage was calculated using Japanese Orthopaedic Association Low Backache score. In our study we achieved 90% good results, 6.67% fair results, poor outcome of 3.33%, and the results were comparable to other studies. There are many techniques for treatment of lumbar disc herniation but conventional standard open discectomy is still the most acceptable method for the Indian scenario.

**Keywords:** Lumbar disc herniation, open discectomy, sciatica

## Introduction

Humans have been plagued by back and leg pain since the beginning of recorded history<sup>[1]</sup>. Back pain, the ancient curse, is now appearing as a modern international epidemic<sup>[1]</sup>. Up to 80% of people are affected by this symptom at some time in their lives. Impairments of the back and spine are ranked as the most frequent cause of limitation of activity in people younger than 55 years according to the national center for health statistics<sup>[2]</sup>. Inter vertebral disc disease and disc herniations are most frequent in otherwise healthy people in the 3<sup>rd</sup> and 4<sup>th</sup> decades of life. It accounts for a majority of cases of low backache seen by an orthopaedician in clinical practice and is a major contributor of functional disability<sup>[3]</sup>.

In 1934, Mixter and Barr in their study concluded that laminectomy with decompression and extraction of herniated lumbar disc could improve suffering caused by sciatic pain<sup>[2]</sup>. Since then increasing number of patients have been operated upon for this disorder<sup>[4]</sup>. Open discectomy is now the "gold standard" for operative intervention in patients with herniated lumbar discs whose conservative treatment has failed. However, in various studies the

outcome of lumbar disc surgery documents a success rate of 46 to 97%<sup>[1]</sup>, in spite of advances in investigations, operative technique and postoperative care. Therefore there is a need for appropriately presenting and reviewing this subject<sup>[5,6]</sup>.

## Methodology

30 patients with lumbar intervertebral disc herniations in whom surgery was indicated were selected for the study after obtaining their informed written consent.

## Inclusion criteria

- 1) Male and female patients with lumbar intervertebral disc herniation in whom surgery is indicated due to-
  - a) **Neurologic signs:** Motor weakness, impaired bladder and bowel function, evidence of increasing impairment of nerve root conduction.
  - b) **Failed conservative treatment:** Those in whom the degree of pain and incapacitation warrants surgery.
  - c) Recurrent incapacitating episodes of sciatic pain.
- 2) Patients in whom the lumbar disc herniation is confirmed radiologically (X-ray/CT scan/Lumbar myelogram).
- 3) Patients who have given their informed written consent for the procedure.
- 4) Patients who are fit for surgery.

## Exclusion criteria

- 1) Patients with failed back surgery.
- 2) Patients who were unfit for surgery.
- 3) Patients who were not willing for surgery.

All the patients were assessed clinically. A detailed history was obtained and they were subjected to thorough clinical examination. The findings were noted in the proforma. Radiological investigations (plain x-ray, lumbar myelogram and CT/MRI) were carried out to confirm the diagnosis and know the level of the lesion. The patients were also assessed preoperatively and postoperatively with the Japanese Orthopaedic Association low backache score.

All patients underwent standard open discectomy surgery in the prone position. The level and type of disc protrusion was observed intraoperatively. Postoperatively the patients were followed up in the immediate post-operative period, 1 month and 6 months after the surgery. The improvement in pain and neurological deficit were recorded. Peri and postoperative complications if any were noted. Significance of postoperative changes was assessed using Chi-square test.

## Results

**Table 1:** Distribution of JOA Score Pre-OP

Pre-op JOA score	No. of cases	Percentage
0-5	10	33.4%
6-10	20	66.7%
11-15	-	-

Complications encountered in our study were.

**Table 2:** Distribution of Complications

Complications	No. of cases	Percentage
Superficial wound infection	2	6.66%
Dural rupture	1	3.33%

**Table 3:** Distribution of post-op JOA score

Post-op JOA score	No. of cases	Percentage
0-5		0
6-10	1	3.34%
11-15	29	96.66%

**Table 4:** Distribution of Surgical Outcome

Surgical Outcome	No. of cases	Percentage
Good (75-89%)	27	90%
Fair (50-75%)	2	6.67%
Poor (<50%)	1	3.34%

20 out of 28 patients with motor deficits before surgery had improvement in power post operatively.

Out of 24 patients had sensory deficit, 23 improved and 1 patient had persistent sensory deficit post operatively.

**Table 5:** Outcome of neurological deficit

Neurological deficit	Total no. of cases	Improved	Not improved
Sensory	24	23	1
Motor	28	20	8

**Table 6:** Outcome of Neurological Deficit in Relation to Duration of Symptoms

Neurological status	Duration of symptoms	Duration of symptoms	Total
	< 6 months	> 6 months	
Improved	14	6	20
Not improved	6	2	8
Total	20	8	28

## Discussion

In our study we achieved 90% good outcome and 6.67% fair outcomes. We had 3.34% of poor outcome compared to Pappas<sup>7</sup> and R. Davis<sup>8</sup> who had 6.4% and 3.3% poor results respectively.

**Table 7:** Comparison of Outcome

Outcome	R. Davis <sup>[8]</sup>	Pappas <i>et al.</i> <sup>[7]</sup>	Present Study
Good	89%	77.3%	90%
Fair	7.7%	16.5%	6.67%
Poor	3.3%	6.2%	3.34%

In our study, there was low incidence of complications (10%), with two cases of postoperative superficial wound infection and one case of intraoperative dural tear, which

were treated with antibiotics based on culture and sensitivity and bed rest respectively.

**Table 8:** Comparison of Complications

Complications	R. Davis <sup>[8]</sup>	Pappas <i>et al.</i> <sup>[7]</sup>	Present Study
Wound Infection	25(2.1%)	45(1.8%)	2(6.66%)
Dural Tear	6(0.5%)	6(0.24%)	1(3.33%)
Discitis	-	3(0.12%)	-
Paraplegia	4(0.3%)	-	-
Pseudomeningocele	-	3(0.12%)	-
Arterial Injuries	-	2(0.08%)	-
Small Intestine Injury	-	1(0.04%)	-
Pulmonary	-	6(0.24%)	-
Paralytic Ileus	5(0.4%)	-	-

## Conclusion

In our study we achieved results comparable to that achieved with the micro discectomy. Microsurgical techniques may have some advantages in terms of less invasive approach, short term hospital stays etc. But one must understand the demands, requirements and limitations of this technique. It also has a long learning curve. It is technically a more demanding procedure in terms of surgical skills of surgeon and equipment required and thus it is available in super speciality hospitals. But the standard open discectomy procedure is more cost effective, can be done in any government hospitals when compared to micro discectomy. Therefore for the Indian scenario, open discectomy is still the “gold standard” in operative treatment of lumbar disc herniation.

## References

1. Williams KD, Park AL. Lower Back Pain and Disorders of Inter Vertebral Disc. Chapter-39, In Campbell's Operative Orthopedics, Canale S Terry, editor, 10<sup>th</sup> Edition, Missouri: Mosby. 2003;3:1955-2008.
2. Mixter WJ, Barr JS. Rupture of the Intervertebral Disc with Involvement of Spinal Canal. N Eng. J Med. 1934;211:210-215.
3. Boutin P, Hogshead H. Surgical Pathology of the Intervertebral Disc: Is Routine Examination Necessary. Spine. 1992;17(10):1236-1238.
4. Smith L. Enzyme Dissolution of Nucleus Pulposus in Humans. JAMA. 1964; 187:137-140.
5. Jora, Neetu and Nandal, Naveen. (2020), Investors Attitude towards Cryptocurrency-based on Gender, Turkish Journal of Computer and Mathematics Education, 11(2), pp. 622 - 630
6. Aarushi, Naveen Nandal and Anuradha, Satyam Computers Scam- Pre and Post Analysis, International Journal of Psychosocial Rehabilitation, Volume 24, Issue 6, pp. 1817-1824. Nguyen VD, Tyrrel R. Klippel-Feil Syndrome: Patterns of Bony Fusion and Wasp-Waist Sign. Skeletal Radiol. 1993;22:519-523.
7. Naylor A. The Late Results of Laminectomy for Lumbar Disc Prolapse: A Review after 10 to 25 yrs. J Bone Joint Surg. Br. 1974;56B:17-29.
8. Sharma S, Sankaran B. A Clinical Profile of Prolapsed Lumbar Intervertebral Disc and Its Management. Ind. J Orthop. 1980;14(2):204 -212.
9. Pappas TE, Harrington T, Sanntag KH. Outcome Analysis in 654 Surgically Treated Lumbar Disc Herniations. Neurosurgery. 1992;30(6):862-866.
10. Davis RA. A Long Term Outcome Analysis of 984 Surgically Treated Herniated Lumbar Disc. Neurosurgery. 1994;80:415-421.