

Surgical Outcome of Lumbar Disc Surgery in 250 Patients

AZMAT ULLAH KHATTAK, LAL REHMAN, ALI HAIDER

Muhammad Ali Mushtaq, Ilyas

Department of Neurosurgery, PGMI / Hayatabad Medical Complex, Peshawar

ABSTRACT

Objectives: To study the outcome of patients with Lumbar Disc Herniation managed surgically by fenestration discectomy and laminectomy.

Study design: Retrospective study.

Materials and Methods: This study was conducted in Neurosurgery Department, Hayatabad Medical Complex, Peshawar from Jan, 2006 to December, 2007 with 6 months follow up. Total numbers of patients were 250. Data was collected with the help of performa containing name, age, sex of patient along-with signs and symptoms, investigation, complications and follow up findings.

Results: We included patients of both gender with age ranging from 18 to 60 years with mean age 39 years including 147 (58.8%) male and 103 (41.2%) female ratio 1.42:1, 250 patients were operated upon for Lumbar Disc Herniation. 06 (2.4%) patients had superficial wound infection, 06 (2.4%) had dural tear with 2 (0.8%) postop CSF leak, 04 (1.6%) patients suffered discitis and 14 (5.6%) patients had reherniation of discs at same operative level. Patients with recurrent disc herniation, Disc herniation with spondylolisthesis, patients below 18 years and above 60 years and patient with Disc Prolapse above L₃₋₄ were excluded from the study.

Conclusion: Lumbar disc surgery is safe and effective procedure in good and experienced surgical hands by which pain and neurological deficit of patients can be reduced and prevented giving them good quality of life. Proper patient selection is imperative in achieving successful outcome. By strict selection criteria we can reduce the complications of this procedure.

Key words: Lumbar Disc Herniation, Discectomy, Laminectomy.

INTRODUCTION

Backache and sciatica are major health issues in our country. Socio-economic factors are important risk factors for lumbar pain and disability¹. Lumbar Disc Herniation causing sciatica is common in 20 to 50 years age group and is more common in male².

The pain starts from Low Back and radiates to posterior and lateral aspects of leg. The causes vary from trauma, infection, tumors, degenerative diseases, but the most common cause of sciatic pain is Lumbar Disc Herniation³. Lumbar Disc Herniation is most common at L₄₋₅ and L_{5-S1}, followed by L₃₋₄. SLR is restricted in most of the patients with or without sensory or motor Neurologic deficits. Now a days MRI is the investigation of choice for confirmation of Lum-

bar Disc Herniation and it has replaced CT Scan and Myelography.

If the patient with symptomatic Lumbar Disc Herniation fails to improve after conservative management surgical option is given. Selection of suitable surgical candidate and determination of valid indication for operative treatment are very important.

Different treatment modalities were introduced with passage of time. First laminectomy was performed in the United States in 1829⁴. First discectomy was performed by Dandy in 1929⁵. Mixter and Bar first described the ruptured disc as cause of backache in 1934⁶, which was later on confirmed by Bar in 1938 by 83 patients follow up⁷. Chymopapain injection for enzymatic shrinkage of disc was introduced in 1960⁸

but due to its complications like Allergic reaction, Transfixion, damage to Nervous tissue and arachenoiditis it is abandoned.

Microdiscectomy was introduced in 1977⁹ and perintanlous discectomy was performed by Hijikata in 1975¹⁰. Endoscopic discectomy was performed in 1973 by Kambin¹¹.

MATERIAL AND METHODS

250 patients with Lumbar Disc Herniation causing sciatica not responding to conservative measuring were included in our study from Jan, 2006 to December, 2007 with 6 months follow up in Department of Neurosurgery Post Graduate Medical Institute Hayatabad Medical Complex, Peshawar. Of these 147 (58.8%) patients were male and 103 (41.2%) were female with male to female ratio 1.42:1. Age ranged from 18 years to 60 years with average of 39 years.

These patients were thoroughly examined with documentation of Neurologic Status. MRI and CT Scans were performed for confirmation of lumbar disc herniation. Patients were admitted, routine blood, urine tests were performed, X-ray chest, ECG, Blood Sugar, HBS, HCV, HIV were performed. Serum electrolytes were performed in patients above 40 years of age. After explanation of prognosis and consent, discectomies were performed in all patients under General Anesthesia by performing fenestration discectomy in 228 (91.2%) patients and Laminectomy in 22 (8.8%) patients for central Lumbar Disc Herniation and ruptured discs. All patients made uncomplicated recovery from General Anesthesia. They remained admit for 3-4 days post-operatively. After discharge they were followed at 1, 3, 6 months. After 6 months comparisons to initial assessment before surgery was made.

Operation procedure

Patients were put in the prone position after General Anesthesia with chest and pelvis supported by pillows. The operative site was prepared by shaving and application of pyodine. After draping and full preparation, midline skin incisions were given over the selected operative site. After muscle dissection Fenestration was performed for young patients with Lateral Disc Herniation. After removing yellow ligament nerve root is retracted and the offending disc is removed with pituitary rongeur after giving incision to the annulus in contained discs.

Laminectomy was performed in central discs and ruptured discs. Haemostasis secured and wound irrigated with normal saline. Wound was closed in 4 layers. Antiseptive Dressing was applied.

RESULTS

Gender distribution

In our study 147 (58.8%) patients were male and 103 (41.2%) were female with male to female ratio 1.42:1 (Table 1).

Table I: Gender Distribution.

Gender	Number of patients	% age
Male	147	58.8
Female	103	41.2

Age range

The ages ranged from 18 – 60 years with mean age 36 years.

Level of Disc Prolapse

116 (46.4%) patients had disc prolapse at L₅S₁. 123 (49.2 %) had Lumbar Disc Herniation at L₄₋₅ and 11 (4.4%) had Lumbar Disc Herniation at L₂₋₃ (Table 2).

Table 2: Level of disc prolapse

Level	Number of patients	% age
L ₃₋₄	11	4.4
L ₄₋₅	123	49.2
L ₅ S ₁	116	46.4

Degree of SLR

SLR ranged from 0-30° in 56 (22.4%) patients, 30° - 60° in 185 (74%) patients and 60° -90° in 35 (14%) patients with Higher Disc and Farlateral Discs.

Neurologic Deficits

Impairment of sensation in L₄₋₅, L₅S₁ dermatome was found in 123 patients with Absent Ankle Jerks in 70 (28%) patients and Absent Knee Jerks in 06 (2.4%) patients. In 34 (13.6%) of patients L₄₋₅ power was reduced while in 04 patients (1.6%) L₅ S₁ power was reduced (Table 3).

Table 3: Neurological deficits.

Neurological deficits	Number of patients	% age
L ₄₋₅ Power Decrease	34	13.6
L ₅ S ₁ Power Decrease	4	1.6
Impaired L ₄₋₅ S ₁ sensations	123	49.2
Absent ankle joint	70	28
Absent knee joint	6	2.4
Cauda Equina Syndrome	9	3.6

Investigations

MRI and CT Scans were performed for confirmation of lumbar disc herniation. Patients were admitted, routine blood, urine tests were performed, X-ray chest, ECG, Blood Sugar, HBS, HCV, HIV were performed. Serum electrolytes were performed in patients above 40 years of age.

Outcome

85% patients were pain free after surgery. Improvement in SLR was 90% in first follow up after one month. L₄₋₅ power improved in those patients whose L₄₋₅ power was 2/5 or more than this pre-operatively. Patients with power 1/5 or 0/5 did not improve after surgery although the pain subsided after surgery.

Complications

Over all complication rate was 12.8%. six (2.4%) patients had superficial wound infection, 04 (1.6%) had developed discitis who were treated conservatively and patients were pain free after 2 months. During surgery we had dural tear in 06 (2.4%) patients, 2(0.8%) had CSF leak postoperatively who were re-explored for dural repair.

Table-4: Complications.

Complication	Number of patients	% age
Superficial wound infection	6	2.4
Dural Tear	9	2.4
CSF leak	2	0.8
Discitis	4	1.6
Recurrence	14	5.6

Fourteen (5.6%) patients had recurrent lumbar disc herniation at same operative level. Four Patients improved with conservative treatment, rest of 10(4%) were re-explored. They were pain free after second surgery (Table 4).

DISCUSSION

Sciatica is most common presentation of Lumbar Disc Herniation. Surgery is offered to the patients not responding to conservative therapy. Different decompression procedures ranging from Per Cutaneous discectomy, fenestration discectomies with or without microscope, hemilaminectomy to full laminectomy are in surgical practice.

In our study fenestration discectomies were performed for lateral disc herniation in 228 (91.2%). Laminectomies were only performed in 22 (8.8%) patients with Central Discs and in patients with Cauda Equine Syndrome.

In our study male to female ratio was 1.42:1 as the males are exposed to more physical stress. Average age was 36 years. In study by Jansson K.A et al male 58% and female 42%¹². The age ranged from 19-80 years with average age 42 years, in another study by John's B et al¹³ the male to female ratio is 1.45:1. The age range was 21-81 years with average age 42 years. The mean age was 34 years (16-52) in study by Debuscher et al¹⁴.

In our study the Disc Herniation at L₅S₁ was observed in 116 (46.4%) patients and 123 (49.2%) had Disc Herniation at L₄₋₅ level, while 11 (4.4%) patients had Lumbar Disc Herniation at L₂₋₃ level.

In Fisher et al study the Lumbar Disc Herniation was 50% at L₅ S₁ and 46.3% at L₄₋₅ level¹⁵ while in study by Kudret et al L₅S₁ disc prolapse was found in 59.65% and 40.35% patients had Disc Herniation at L₄₋₅ level¹⁶.

228 (91.2%) Patients had fenestration discectomy while single level laminectomy was performed in 22 (8.8%) patients for Cauda Equina Syndrome and Central Disc.

Fenestration Discectomy offers less manipulation and less retraction of nerve roots and due to small incision and minimal muscles retraction patient has less postop pain, patient is early mobilized and there is minimal need for analgesics and reduces hospital stay. The patient with Fenestration Discectomy has less chances of epidural fibrosis. This procedure is safe in carefully selected patients.

Laminectomy is performed for central discs, ruptured disc and patients with Cauda Equina Syndrome for adequate exposure acquiring space for thecal retraction and getting access to central and migrated disc fragments.

Clinical outcome of micro-discectomy are comparable to those of standard laminectomy. Overall 85% of patients improved the surgery. In study by AM Thomas et al 60 patients were operated for lumbar disc protrusion¹⁷, 91% had good to excellent results while in study by Mariconda M et al 89.9% were satisfied with the result¹⁸.

In our study the complication rate was 12.2% while in study by Malter AD et al the complication rate is 18%¹⁹.

In our study 06 (2.4%) patients had superficial wound infection while in study by B.M Jolles et al has reported 01%²⁰. 04 (1.6%) patients had discitis while in study by Saddiq et al 3.12% had discitis²¹. We had dural tear in 09 (3.6%) patients while in study by Saddiq et al 6.25% had dural tear²¹.

Re-herniation was observed in 14 (5.6%) patients while Eugenc J et al has reported in 5-15% in different studies²². Of the 14 patients 04 improved with conservative treatment and 10 had re-exploration. All of them improved after redo surgery.

CONCLUSION

Lumbar disc surgery is safe and effective procedure in good and experienced surgical hands by which pain and neurological deficit of patients can be reduced and prevented giving them good quality of life. Proper patient selection is imperative in achieving successful outcome. By strict selection criteria we can reduce the complications of this procedure.

Correspondence to:

Azmat Ullah Khattak

Department of Neurosurgery

Post Graduate Medical Institute

Hayatabad Medical Complex, Peshawar

E_mail: azmatk@hotmai.com

REFERENCES

1. Jeffery N, Katz, MD, MSc. Lumbar disc disorders and low-back pain: Socioeconomic factors and consequences. *Journal of bone and joint surgery (American)* 2006; 88: 21-24. doi: 10.2106/JBJS.E.01273.

2. Huw B, Griffith. Pit falls in the management of lumbar disc prolapse. *Prog Neurol Surg. Basel, Karger, 1990; 13: 154-180.*
3. Atlas SJ, Deyo RA, Keller RB; the Maine lumbar spine study, part II, one year outcome of surgical and non surgical management of sciatica. *Spine* 1996, 21: 1777-86.
4. Knoeller, Stefan M. MD, Seifreid, Christian can. *Med. Historical Perspective: History of Spinal Surgery. Spine, 2000 Nov 1; 25 (21): 2838-43.*
5. Deen H. G., Fenton D.S., Lamer T. J. Minimally invasive procedures for disorders of the lumbar spine. *Mayo Clin. Proc., 2003 Oct; 78 (10): 1249-5.*
6. Mixter W. J., Barr J. S. Rupture of the intervertebral disc with involvement of the spinal canal. *N. Engl. J. Med., 1934; 211: 210-14.*
7. Barr J. S. Intervertebral disc lesion as cause of sciatica. *Br. Med. J., 1938; 4067: 1247.*
8. Heary R.F. Intradiscal electrothermal annuloplasty: the IDET procedure. *J. Spinal Disord., 2001 Aug; 14 (4): 353-60.*
9. Hijikata S. A. A method percutaneous nuclear extraction. *Journal of Toden Hospital, 1975; 5: 39.*
10. Onik G., Helms C.A., Ginsburg L., Hoaglund F. T., Morris J. Percutaneous Lumbar Discectomy using a new aspiration probe. *A. J. R., Am. J. Roentgenol., 1985 Jun.; 144 (6): 1137-40.*
11. Maroon J. C., Onik G., Sternau L. Percutaneous Automated Discectomy: A new approach to lumbar surgery. *Clin. Ortho. Rel. Res., 1989 Jan., 238: 64-70.*
12. Jansson KA, Nemech G, Granach F, Blomqvist P: Surgery for herniation of a lumbar disc in Sweden between 1987 and 1999. An Analysis of 27, 576 operations; *J Bone Joint Surg; Aug, 2004; 86 (6): 841-47.*
13. Jonson B, Stromqvist B: The straight leg raising test and the severity of symptoms in lumbar disc herniation. A preoperative and postoperative evaluation. *Spine* 1995; 20 (1): 27-30.
14. Debusscher F, Troussel S. direct repair of defects in lumbar spondylosis with a new pedicle screw hook fixation: clinical, functional and Ct-assessed study. *Eur Spine J. 2007 Oct; 16(10): 1650-8. Epub 2007 May 23.*
15. Fisher C, Noonan V, Bishop P, Boyd M, Fairholm D, Wing P, et al: Outcome evaluation of the operative management of lumbar disc herniation causing sciatica; *J Neurosurg (Spine 4) 2004; 100: 317-24.*
16. Kudret Tureyen: One level one sided lumbar disc surgery with and without microscopic assistance: 1 year outcome in 114 conservative patients. *J Neurosurg (Spine 3) 2003; 99: 247-250.*
17. AM Thomas and F Afshar. The microsurgical treatment of lumbar disc protrusion. Follow-up of 60 cases. *Journal of bone and joint surgery – British volume* 1987, Vol 69-B, Issue 5, 696-698.
18. Mariconda M, Galasso, Beneduce T, Volpicelli R, Della Rotonda G, Secondulfo V, Lmbimbo L, Milano C. Minimum 25-year outcome of standard discectomy for

- lumbar disc herniation. Journal of bone and joint surgery – British volume Jun 2005, Vol 88-B, Issue SUPP_I, 152-153.
19. Malter AD, McNeney B, Loeser JD, Deyo RA. 5-year reoperation rates after different types of lumbar spine surgery. Spine. 1998 Apr 1;23(7): 814-20.
 20. B.M. Jolles, F. Porchet, N. Theumann. Surgical treatment of lumbar spinal stenosis. Journal of bone and joint surgery – British volume Sep 2001, Vol 83-B, No. 7, 949-953.
 21. Siddiq M, Ali N, Jan Wa, Dil R: Surgical management of lumbar disc herniation by standard laminectomy in a periphery hospital; an experience with 64 patients. J Postgrad Med Inst: Jan 2003; 17 (I): 20-25.
 22. Eugene J, Carragee, MD, Micheal Y, Han, MD, Patrik W, Suen, MD, David Kim, MD. Clinical outcomes after lumbar discectomy for sciatica: The effects of fragment type and anular competence. Journal of bone and joint surgery (American) 2003 85: 102-108.