

Original Research Article

Functional outcome of patients undergoing lumbar discectomy

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ABSTRACT

Background: Sciatica resulting from a lumbar intervertebral disc herniation is the most common cause of radicular leg pain in adult working population. It can be treated with both conservative and operative methods. In our study, surgical treatment of lumbar disc prolapse has been done by open discectomy. We wish to assess the outcome of surgery in patients with lumbar disc prolapse undergoing lumbar discectomy.

Methods: 40 patients were included in this study and were followed up for up to 1 year postoperatively. We assessed the outcome of each patient with ODI and VAS post-operatively and on follow-up at 3 weeks, 6 months and 1 year. Subjective evaluation of the patient's satisfaction at the final follow-up was also done.

Results: We found that males had higher incidence of PIVD with an average duration of symptoms before surgery about 8.62 months. Left side was most involved and level L4-L5 was most involved level. The mean ODI and VAS score pre-operatively were 26.85 ± 4.20 and 7.73 ± 0.88 respectively, which changed to 4.48 ± 5.15 and 1.70 ± 1.57 , respectively at 1 year post-operative follow-up. These were statistically highly significant. Most of the patients (34) gave a subjective evaluation as excellent at 1 year follow-up.

Conclusions: Our study established that open discectomy has a satisfactory functional outcome and leads to a significant improvement in the patients' quality of life.

Keywords: Sciatica, Disc prolapse, Radiculopathy

INTRODUCTION

In India, nearly 60 percent of the people have significant back pain at some time or the other in their life.¹ Sciatica resulting from a lumbar intervertebral disc herniation is the most common cause of radicular leg pain in adult working populations.² Most patients with acute lumbar disc herniation will recover with the help of non-surgical treatments.³ However surgery is necessary for 10% of patients with an incomplete resolution of symptoms.⁴ It has been found that patients who had undergone surgical treatment had experienced fast pain relief, improvement of function and satisfaction in comparison to conservative patients.⁵ All these surgeries have good outcome.⁶ Few studies also suggest that surgical outcome differs with

pre-operative duration of symptoms.⁴ Our aim was to assess the outcome of patients undergoing open lumbar discectomy, evaluate complications, if any. We used Oswestry Disability Index (ODI), Visual Analog Scale (VAS) scoring system at each follow up and Subjective evaluation of the patients satisfaction at the final follow-up when asked about what he thought about the outcome of the surgical procedure was done to evaluate the outcome of patients who underwent discectomy.

METHODS

This was a prospective study conducted over a period of two years, November 2015 to November 2017 in Teaching Tertiary Care Hospital at Udaipur. Patients who

met with the inclusion criteria were included in the study after scrutinizing them for any exclusion criteria. We included Patients with predominant unilateral/ bilateral radiating leg pain with or without neurological symptoms who were diagnosed as a case of Prolapse of Intervertebral Disc (PIVD) after Magnetic Resonance Imaging (MRI) confirmation and who did not respond to conservative treatment for at least 6 weeks and patient presenting with Cauda Equine Syndrome (CES). We excluded any patient with multiple level disc prolapses, patients with vertebral fractures, failed back syndrome, spinal metastasis and associated with other pathological conditions of the spine.

40 patients were included in this study and were followed up for up to 1 year postoperatively. After adequate pre-operative preparations, patient was taken for surgery electively. The patients with CES were taken for surgery within 6 hours of the presentation preferably. All this patients were operated by the same senior orthopaedic surgeon. We performed laminectomy with discectomy in patients presenting with Lumbar Canal Stenosis (LCS) and interlaminar flavotomy and discectomy through fenestration in patients without LCS.

We assessed the outcome of each patient with ODI and VAS post-operatively and on follow-up at 3 weeks, 6 months and 1 year. Subjective evaluation of the patients satisfaction at the final follow-up when asked about what he thought about the outcome of the surgical procedure, was also done. VAS is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured.⁷ ODI is an extremely important tool that researchers used to measure patient's functional disability due to low back pain. The test is considered as gold standard of low back functional outcome tools.⁷ It is validated and its reliability and sensitivity have been demonstrated. We recorded the absolute value and change in ODI and VAS score between pre-operative and post-operative score.

RESULTS

Of 40 patients, 26 were males and 14 females (Figure 1) with mean age of 46.02 years (23-70). Average duration of symptoms before the surgery was 8.62 months (1.2 - 24). Most of the patients were heavy manual workers (62.50%) including labourers and farmers (Figure 2).

Low back pain and radicular pain was the most common symptoms with which patients presented (100%). Other complaints were tingling and numbness (paresthesia) (37.50%), weakness over lower limb (88.8%) and difficulty in urination (12.5%) (Figure 3). On examination, restricted spinal movements due to muscle spasm was the most common finding (87.5%) followed by a positive SLRT (82.5%) and neurological deficits (75%).

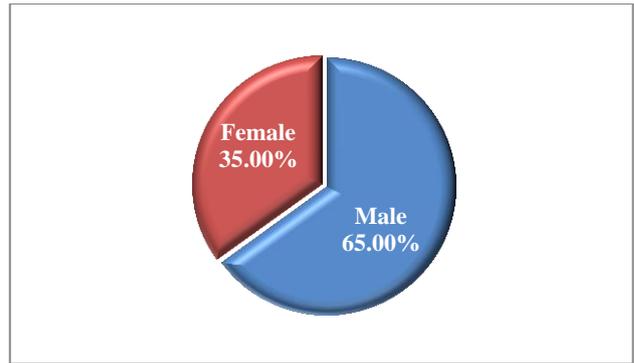


Figure 1: Sex distribution.

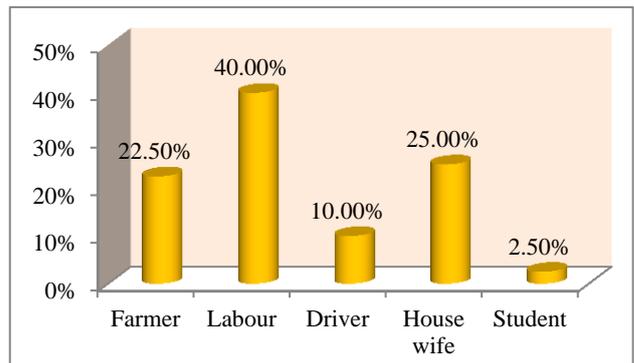


Figure 2: Distribution of occupation.

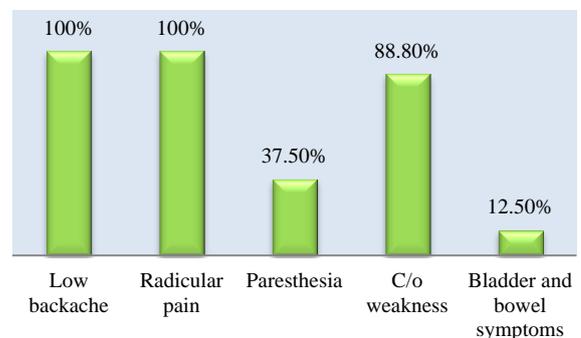


Figure 3: Distribution of symptoms.

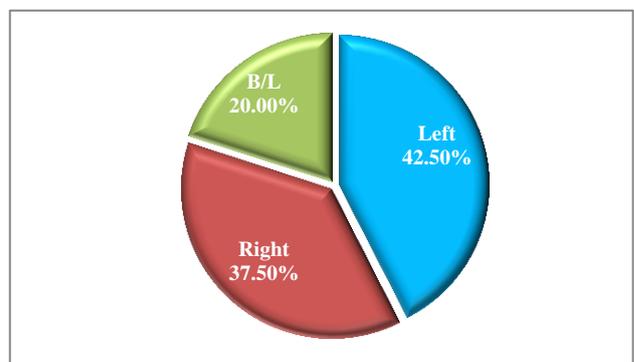


Figure 4: Distribution of side.

Left side was mostly involved (42.5%) followed by right side radiculopathy and bilateral involvement (Figure 4). L4-5 level was most commonly involved level (72.5%). All the patients had herniated disc with most of them presenting with protrusion (82.5%) followed by extrusion and sequestration in their MRI. Complication rate was only 10% out of which 2 patients (5%) had superficial surgical site infection and 2 patients (5%) had dural tear.

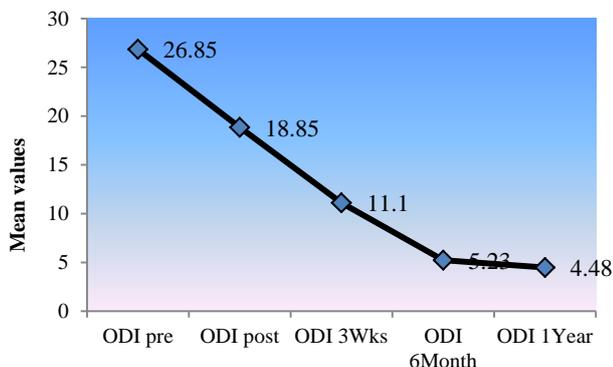


Figure 5: Decrease in mean ODI scores post operatively.

We used ODI questionnaire and calculated the Index pre-operatively, post-operatively and at each follow-up at 3 weeks, 6 months and 1 year to evaluate the functional outcome of the patients (Figure 5). The mean ODI score pre-operatively was 26.85±4.20. The ODI Score post-operatively was 18.85±2.09, at 3 weeks follow-up was 11.10±2.45, at 6 months follow-up was 5.23±2.72 and at 1 year follow-up was 4.48±5.15. The scores on each follow up were compared to the pre-operative score using dependent 't' test and was found to be statistically highly significant (p<0.001).

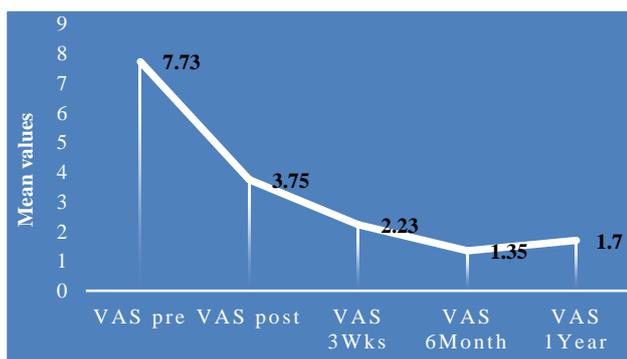


Figure 6: Decrease in mean VAS scores.

We used the VAS is a scale to analyse the leg pain of the patient pre-operatively, post-operatively and at each follow-up at 3 weeks, 6 months and 1 year (Figure 6). The mean VAS pre-operatively was 7.73±0.88 which reduced to 3.75±0.78 post-operatively. The mean VAS serially reduced at each follow-up with 2.23±0.66 at 3 weeks follow-up, 1.35±1.00 at 6 month follow-up and 1.70±1.57 at 1 year follow-up. The VAS score post-

operatively and at each follow-up were compared to the pre-operative score and was found to be highly significant (p<0.001).

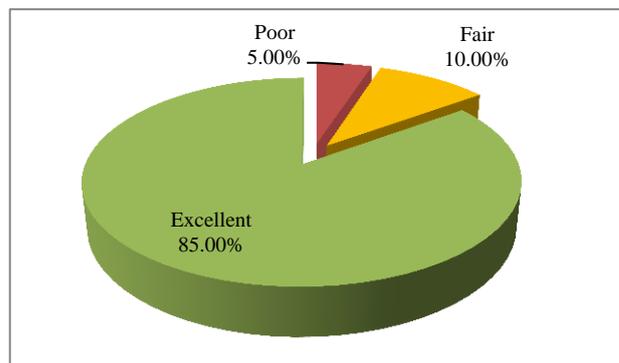


Figure 7: Subjective evaluation of the outcome of the procedure at 1 year.

The subjective evaluation of the patients satisfaction at the final follow-up when asked about what he thought about the outcome of the surgical procedure was done. The patient was asked choose between excellent, good, fair and poor outcome. Maximum number of patients had excellent result (85%), none had good, 10% had fair and 5% had poor outcome (Figure 7). It was observed that patients with excellent subjective analysis consisted more of those with shorter duration of the disease.

DISCUSSION

We prospectively followed 40 patients with lumbar disc herniation after discectomy for a period of 1 year. Our study showed that most of the patients who underwent were male, belonging to heavy manual labour group. Our findings were similar to studies those of Swamy et al with 72% males and 28% females, Chakrabarty et al with 68% and 32% females and Mariconda with 71.11% males and 28.89% females.⁷⁻⁹ Sangwan SS et al also observed that only 3 out of 28 patients were sedentary worker and remaining 25 patients were labourer.¹⁰ Another study by Mishra SK et al on 67 patients found that 60% (40) were involved in heavy work.¹¹ Mittal A et al observed that 62.5% of patients in his series were engaged in strenuous work.¹² The result of our study and others suggest that lumbar PIVD was more prevalent in male population who performed heavy manual labour.

L4-L5 was the most involved level with protrusion as the most common type of disc herniation. Left side was the most involved side with radiculopathy. Swamy et al conducted a study on 50 patients of which 4 (8%) patients had prolapsed intervertebral disc at L2-L3 level and 10 (20%) patients had disc prolapsed at L3-L4 level, 22 (44%) patients had disc prolapsed at L4-L5 level and 14 (28%) patients had disc prolapsed at L5-S1 level.⁷ Sharma MK et al in their study showed 40 (53.3%) patients were with L5-S1 disc disease and 35 (46.7%) were with L4-L5 disc disease.⁵ In other study by Mittal A

et al had similar findings of herniation at L4-5 level in 80.5% patients.¹² All the findings showed an increased chance of disc herniation at L4-L5 level.

In our study the complication rate was 10% out of which 2 patients (5%) had superficial surgical site infection, 2 patients (5%) had dural tear. Mittal A et al reported dural tear in 2.5% of the patients alongwith wound infection in 2.5% and neurological deficit in 2.5%.¹² Sangwan et al reported dural tears in 3 cases, retention urine in 3 cases and transient back pain in 5 patients. They had none case of superficial skin infection, neurological disorder and nerve root injury.¹⁰

In our study, we used the ODI questionnaire to analyse the functional status of the patient pre and post-operatively, and VAS score was used to analyse the difference in the pain the patient felt pre-operatively to that of post-operative pain. In this study, the ODI and VAS score serially decreased with each follow up with the ODI (26.85±4.20) and VAS (4.48±5.15) being the least at 1 year follow-up. This decrease was statistically compared using paired 't' test and was found to be highly significant for both VAS and ODI (p<0.001). There was a greater degree of satisfaction with the surgical outcome in those patients with a shorter duration of sciatica. Sharma MK et al evaluated the outcomes after lumbar discectomy for degenerative spine disease at six months post-operative period. In their study, it was evident that most of the patients indicated that they benefited from surgery. There was a significant change with reference to nearly all variables among post-operative patients in his study. There was less severity in pain in the post-operative stages among the patients studied for same cause.⁵ In the study conducted by Chakrabarty et al, the preoperative mean±SD VAS score was 8.8±0.816 on a scale of 10. Postoperatively the mean±SD score of pain on the VAS came out to be 2.96±1.02 which is found to be statistically significant (p <0.005) when compared with preoperative pain. The decrease in pain was statistically significant in his study post-operatively.⁸ These findings were similar to that of our study.

In our study, we subjectively analysed the outcome of the procedure by asking patient about what he felt about the outcome of the procedure and graded it. Maximum number of patients had excellent result (85%), none had good, 10% had fair and 5% had poor outcome. The mean duration of symptoms for patients having excellent outcome was 8.56±6.43 months. The patients undergoing the surgery also had improvement in their neurological symptoms over time and the decrease in severity of sciatica was also noted as their quality of life improved.

Our study ascertains that conventional open discectomy has excellent functional outcome in most of the patients. There were statistically significant changes in ODI and VAS scores with excellent as outcome in most of the patients.

CONCLUSION

From the above results it is found that most of the patients benefitted from lumbar discectomy surgery in terms of rapid reduction of pain. Our study established that discectomy has a satisfactory functional outcome and improvement in the patients' quality of life.

A limitation of this study is its short duration of follow-up. A larger study with a longer follow-up may perhaps be needed to study the long term outcome after surgery and to assess the relation of the outcome with the pre-operative duration of disease.

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Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Mathew AC, Safar RS, Anithadevi TS, Banu MS, Shankar SL, Rai B, et al. The prevalence and correlates of low back pain in adults: A cross sectional study from Southern India. *International Journal of Medicine and Public Health.* 2013;3(4):342-6.
2. Atlas S, Keller R, Wu Y, Deyo R, Singer D. Long-Term Outcomes of Surgical and Nonsurgical Management of Sciatica Secondary to a Lumbar Disc Herniation: 10 Year Results from the Maine Lumbar Spine Study. *Spine.* 2005;30(8):927-35.
3. Heider D, Kitze K, Zieger M, Riedel-Heller S, Angermeyer M. Health-related quality of life in patients after lumbar disc surgery: a longitudinal observational study. *Quality of Life Research.* 2007;16(9):1453-60.
4. Ng LC, Sell P. Predictive value of the duration of sciatica for lumbar discectomy. A prospective cohort study. *J Bone Joint Surg Br.* 2004;86:546-9.
5. Sharma MK, Chichanovskaya L, Shlemsky V, Petrukhina E. A Comprehensive Study of Outcome after Lumbar Discectomy for Lumbar Degenerative Spine Disease at 6 Months Post-Operative Period. *The Open Neurosurgery Journal.* 2013;6(1):1-5.
6. Dohrmann G, Mansour N. Long-Term Results of Various Operations for Lumbar Disc Herniation: Analysis of over 39,000 Patients. *Medical Principles and Practice.* 2015;24(3):285-90.
7. Swamy A, Swamy A, Sharma K, Khirsagar A. Functional Outcome of Discectomy for Lumbar Disc Prolapse. *Journal of Spine.* 2017;6(4).
8. Chakrabarty PS. Excision of lumbar disc through fenestration: A Prospective study to analyse functional results. *Ind J Med Res Pha Sci.* 2015; 2(1): 10–13.
9. Mariconda M, Galasso O, Secondulfo V, Cozzolino A, Milano C. The functional relevance of neurological recovery after lumbar discectomy: A

- FOLLOW-UP OF MORE THAN 20 YEARS. J Bone Joint Surg Br. 2008;90(5):622-8.
10. Sangwan SS, Kundu ZS, Singh R, Kamboj P, Siwach RC, Aggarwal P. Lumbar disc excision through fenestration. Indian Journal of Orthopaedics. 2006;40(2):86-9.
 11. Mishra SK, Mohapatra NC, Pradhan NK, Mohapatra MK. Lumbar disc excision: comparative study of Laminectomy and interlaminar fenestration. Indian J Orthopaedics. 1998;32(3):153-5.
 12. Mittal A, Chandrasekhar A, Mohan R, Rallapalli R, Prasad S. Analysis of the Functional Outcome of Discectomy in Lumbar Disc Prolapse. IOSR Journal of Dental and Medical Sciences. 2015;14(5 ver. VI):73-80.

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