



OPEN ACCESS



OUTCOME OF ENDOSCOPIC LUMBAR DISCECTOMY FOR THE TREATMENT OF SCIATICA

Riaz Ur Rehman¹, Mohammad Nawaz Khan², Mian Iftihar Ul Haq¹, Sajjad Ullah¹✉

¹ Department of Neurosurgery, Medical Teaching Institute, Lady Reading Hospital Peshawar – Pakistan.

² Department of Neurosurgery, Medical Teaching Institute, Hayatabad Medical Complex Peshawar – Pakistan.

Address for correspondence:
Sajjad Ullah

Department of Neurosurgery, Medical Teaching Institute (MTI), Lady Reading Hospital Peshawar - Pakistan.

E-mail:
sajjad.kmc@gmail.com

Date Received:
August 27, 2020

Date Revised:
February 20, 2021

Date Accepted:
March 10, 2021

This article may be cited as

Rehman RU, Khan MN, Haq MIU, Ullah S. Outcome of endoscopic lumbar discectomy for the treatment of sciatica. *J Postgrad Med Inst* 2021; 35(1): 23-5. <https://doi.org/10.54079/jpmi.35.1.2760>

ABSTRACT

Objective: To evaluate the outcome of endoscopic lumbar discectomy in patients having sciatica due to single level prolapsed disc.

Methodology: This descriptive study was conducted in neurosurgery departments of Lady Reading Hospital and Hayatabad Medical Complex Peshawar from June 2017 to December 2019, after approval from the ethics committee. All patients with straight leg raising (SLR) less than 60 degree, failed conservative treatment and with single level prolapsed disc were included while redo cases, cauda equine syndrome and traumatic disc prolapse associated with fractures were excluded. Per operative and post operative complications were documented. Patients were followed up for 3 months. Data was collected and analyzed with SPSS version 20.

Results: One hundred and fifteen endoscopic lumbar discectomies were done. There were 75 (65.2%) male and 40 (34.8%) female patients. Age range was 17 to 63 years with mean age of 31.0±2.13 years. L5-S1 was involved in 67 (58.26%) cases, L4-5 in 42 (36.52%) cases and L3-4 in 6 (5.22%) cases. Procedure time ranged from 35 to 125 min with a mean of 62 minutes. Four cases were converted to open discectomies due to technical difficulties. Sciatica pain relief was achieved in 110 (95.65%) cases. Surgical site infection was observed in 2 (1.74%) cases.

Conclusion: Endoscopic discectomy has acceptable rate of complications and good post-operative pain relief.

Key Words: Endoscopic lumbar discectomy, Outcome, Sciatica

INTRODUCTION

Sciatica due to prolapsed lumbar intervertebral disc can be treated both conservatively as well as surgically.¹ The ultimate target is to alleviate the pain along with other symptoms and to make the patient resume a normal life as early as possible.² Open lumbar microdiscectomy (OLD) used to be the gold standard but now the era has changed and new trends are evolving rapidly.³ Conventional open discectomy was modified to microscopic discectomy to reduce tissue damage, chances of spinal instability and show good clinical outcome. So microscopic discectomy was introduced and it became the gold standard over time.¹⁻⁴ After the introduction of minimally invasive techniques in various surgical procedures, micro endoscopic discectomy was introduced with encouraging clinical outcomes.⁵⁻⁸

Several minimal endoscopic techniques have been introduced over the past one or two decades. The issue with these techniques are the prolong surgical time,⁹⁻¹¹ potentially higher complications and failure rate,^{7,11} requiring careful patient selection¹²⁻¹⁴ and significant learning curve, thus making it difficult to proceed with the daily routine and no better outcome than conventional surgery. Above all, the outcome is not different

from conventional surgery. Therefore, majority of these techniques are out of favour now. To minimise the problems associated with the new techniques, the latest endoscopic technique was developed with the Easy-Go system. This technique of endoscopic disc surgery has yielded very promising results. The purpose of this study was to evaluate the outcome of the new endoscopic discectomy technique in patients with herniated lumbar disc in terms of post-operative pain relief and development of complications.

METHODOLOGY

This descriptive study was conducted on 115 patients in neurosurgery departments of Lady Reading Hospital and Hayatabad Medical Complex Peshawar, from June 2017 to December 2019, after institutional ethical approval. Consent was taken from all the patients before their enrollment in the study. Only those patients were enrolled in whom SLR sign was less than 60 degree and prolapsed disc in lumbar region was evident on MRI. Recurrent discs patients were excluded. Detailed history, clinical findings and MRI lumbosacral spine results were documented in patient's proforma before surgery. All patients were operated in prone

position under general anesthesia. Surgical level was identified before incision and reconfirmed before drilling of the lamina. Para median skin and facial stabbing was done at required level. Standard dilator system was used for muscular dilation. The surgical procedure was carried out through a working sheath after dilators removal. A good endoscopic view was achieved with 30° Hopkins optic. Discectomy was performed with or without nerve root retraction. Single stitch skin closure was performed. Post operatively, patients were allowed to sit and were encouraged for immediate mobilization.

Patients' demographic details, management details and procedure outcome were documented. The collected information were analyzed in statistical package of social sciences (SPSS) version 20.

RESULTS

Age range of the patients was 17 to 63 years with a mean age of 31.0±2.13 years. There were 75 (65.2%) males and 40 (34.8%) females. Out of all, 62 were right sided and 53 were left sided disc prolapse. L5-S1 was involved in 67 (58.26%) cases, L4-5 in 42 (36.52%) cases and L3-4 in 6 (5.22%) cases. Surgical time ranged from 35-125 minutes with a mean of 62 minutes for a single level procedure. Four cases were converted to open discectomies, out of which, 3 patients were switched due to a technical difficulty and in the fourth patient, nerve root was fixed in the lateral recess by the prolapsed disc from underneath. Surgical site infection was observed in 2 (1.74%) cases.

Sciatica pain relief was achieved in 110 (95.65%) cases while five (4.35%) patients had remnant leg pain. Out of all, 110 patients were without regular pain medication at first follow up visit. The rest five required analgesics for back pain or pseudo radicular pain.

DISCUSSION

In the modern era of technology, there has been increasing demand from patients for minimally invasive spine surgery. However, at the same time, neither the surgeon nor the patient can compromise on the safety of procedure. Many of the minimally invasive endo-

scopic devices are associated with frequent complications because of the long learning curve, prolong surgical timings, limited indications and high cost. We opted for "Easy-Go endoscopy system" to minimize the above mentioned problems and yet effectively carry out the procedure.¹⁵ Prolapsed disc is more common in young age and male population because male people are involved in hard laborious jobs and consequently they suffer prolapsed disc more frequently as compared to female population. Other local researchers had similar findings in their studies.¹⁶

In the present study, we encountered 1 case of per operative dural injury which is similar to the findings by another study which found only 1% per op dural injury in Percutaneous Endoscopic Lumbar Discectomy (PELD).¹⁷ Most patients had no sciatica pain at discharge and at one month after surgery. These findings are in line with other studies results.¹⁵ PELD reduces incidence of spondylodiscitis, which was noted only in 2 patients with surgical site infection where as no case of spondylodiscitis was seen in post operative review. Gu et al noted reduced rate, where out of 209, only 1 patient was documented for disc infection.¹⁸ Over all, both microscopic and endoscopic discectomies yield excellent results in expert hands.^{19,20}

Literature shows that between 5 to 20% of patients remain unsatisfied after discectomy for a number of reasons.^{21,22} A study including 307 cases, recorded 90 percent satisfaction rate for endoscopic discectomy.²³

No patients in our study was noted to have developed iatrogenic nerve root injury but 2 of our patients had numbness in legs. They already had numbness before surgery but their symptoms were masked by severe pain. The cause of low back pain after lumbar disc surgery is still a bit unclear. Factors like epidural fibrosis, pre-existing degenerative spine or segmental instability, psychological disturbance and job compensation are some reasons that may cause persistent low backache. Literature has indicated this problem in almost similar frequency after surgery.²²⁻²⁴

The results of endoscopic surgery in terms of pain relief and associated complications are within the range of the published data in various parts of the world. However, we believe that no definite conclusions can

be drawn as control group was missing. Therefore, large scale, randomized controlled trials are recommended in the future to give evidence of clinically superior results with the endoscopic system.

CONCLUSION

The study concluded that endoscopic discectomy has shown minimum number of complications and has proved to be a good post operative pain relief procedure.

REFERENCES

1. Kim M, Lee S, Kim HS, Park S, Shim SY, Lim DJ. A comparison of percutaneous endoscopic lumbar discectomy and open lumbar microdiscectomy for lumbar disc herniation in the korean: a meta-analysis. *BioMed Res Int.* 2018; 2018: 9073460. <https://doi.org/10.1155/2018/9073460>.
2. Dohrmann GJ, Mansour N. Long-term results of various operations for lumbar disc herniation: analysis of over 39,000 patients. *Med Princ Pract.* 2015; 24(3): 285-90. <https://doi.org/10.1159/000375499>.
3. Casal MR, Castro MM, Hernández BM, Bravo JA, Jorge FJ. Long-term outcome after microendoscopic discectomy for lumbar disk herniation: a prospective clinical study with a 5-year follow-up. *Neurosurg.* 2011;68(6):1568-75. <https://doi.org/10.1227/NEU.0b013e31820cd16a>
4. Claudius T, Martin B, Johann S, Peter S. Outcome after lumbar sequestrectomy compared with microdiscectomy: a prospective randomized study. *J Neurosurg Spine.* 2005;2(3):271-8. <https://doi.org/10.3171/spi.2005.2.3.0271>.
5. Kulkarni AG, Bassi A, Dhruv A. Microendoscopic lumbar discectomy: technique and results of 188 cases. *Indian J Orthop.* 2014;48(1):81-7. <https://doi.org/10.4103/0019-5413.125511>.
6. Wu X, Zhuang S, Mao Z, Chen H. Microendoscopic discectomy for lumbar disc herniation: surgical technique and outcome in 873 consecutive cases. *Spine.* 2006;31(23):2689-94. <https://doi.org/10.1097/01.brs.0000244615.43199.07>.
7. Jhala A, Mistry M. Endoscopic lumbar

- discectomy: Experience of first 100 cases. *Indian J Orthop.* 2010;44(2):184-90. <https://doi.org/10.4103/0019-5413.62051>.
8. Destandau J. [Technical features of endoscopic surgery for lumbar disc herniation: 191 patients.] *Neurochir.* 2004; 50(1):6-10. [https://doi.org/10.1016/s0028-3770\(04\)98300-2](https://doi.org/10.1016/s0028-3770(04)98300-2).
 9. Righesso O, Falavigna A, Avanzi O. Comparison of open discectomy with micro-endoscopic discectomy in lumbar disc herniations: results of a randomized controlled trial. *Neurosurg.* 2007;61(3):545-9. <https://doi.org/10.1227/01.NEU.0000290901.00320.F5>.
 10. Katayama Y, Matsuyama Y, Yoshihara H, Sakai Y, Nakamura H, Nakashima S, et al. Comparison of surgical outcomes between macro discectomy and micro discectomy for lumbar disc herniation: a prospective randomized study with surgery performed by the same spine surgeon. *J Spinal Disord Tech.* 2006;19(5):344-7. <https://doi.org/10.1097/01.bsd.0000211201.93125.1c>.
 11. Xia Y, Zhang Q, Gao X, Wang K, Zhang X, Du Y, et al. Posterior percutaneous endoscopic lumbar discectomy combined with the vertical anchoring technique for lumbar disc herniation with distant upward migration. *J Orthop Surg Res.* 2019;14:467-75. <https://doi.org/10.1186/s13018-019-1519-9>.
 12. Kim MJ, Lee SH, Jung ES, Son BG, Choi ES, Shin JH, et al. Targeted percutaneous transforaminal endoscopic discectomy in 295 patients: comparison with results of microscopic discectomy. *Surg Neurol.* 2007;68(6):623-31. <https://doi.org/10.1016/j.surneu.2006.12.051>.
 13. Ruetten S, Komp M, Godolias G. A new full-endoscopic technique for the interlaminar operation of lumbar disc herniations using 6-mm endoscopes: prospective 2-year results of 331 patients. *Minim Invasive Neurosurg.* 2006;49(2):80-7. <https://doi.org/10.1055/s-2006-932172>.
 14. Ruetten S, Komp M, Merk H, Godolias G. Use of newly developed instruments and endoscopes: full-endoscopic resection of lumbar disc herniations via the interlaminar and lateral transforaminal approach. *J Neurosurg Spine.* 2007;6(6):521-30. <https://doi.org/10.3171/spi.2007.6.6.2>.
 15. Oertel JMK, Mondorf Y, Gaab MR. A new endoscopic spine system: the first results with "Easy GO". *Acta Neurochir.* 2009;151:1027-33. <https://doi.org/10.1007/s00701-009-0454-7>.
 16. Raja RA, Khemani VD, Lakhair MA, Khan SA. Discectomy in single level lumbar disc disease. *J Ayub Med Coll Abbottabad.* 2012;24(2):81-3.
 17. Pan M, Li Q, Li S, Mao H, Meng B, Zhou F, et al. Percutaneous endoscopic lumbar discectomy: indications and complications. *Pain Physician.* 2020;23(1):49-56.
 18. Gu YT, Cui Z, Shao HW, Ye Y, Gu AQ. Percutaneous transforaminal endoscopic surgery (PTES) for symptomatic lumbar disc herniation: a surgical technique, outcome, and complications in 209 consecutive cases. *J Orthop Surg Res.* 2017; 12: 25. <https://doi.org/10.1186/s13018-017-0524-0>.
 19. Atlas SJ, Keller RB, Wu YA, Deyo RA, Singer DE. 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. <https://doi.org/10.1097/01.brs.0000158954.68522.2a>.
 20. Gibson JN, Grant IC, Waddell G. The Cochrane review of surgery for lumbar disc prolapse and degenerative lumbar spondylosis. *Spine.* 1999;24(17):1820-32. <https://doi.org/10.1097/00007632-199909010-00012>.
 21. Schoeggel A, Maier H, Saringer W, Reddy M, Matula C. Outcome after chronic sciatica as the only reason for lumbar microdiscectomy. *Journal of spinal disorders & techniques.* 2002;15(5):415-9. <https://doi.org/10.1097/00024720-200210000-00012>.
 22. Law JD, Lehman RA, Kirsch WM. Reoperation after lumbar intervertebral disc surgery. *J Neurosurg.* 1978;48(2):259-63. <https://doi.org/10.3171/jns.1978.48.2.0259>.
 23. Yeung AT, Tsou PM. Posterolateral endoscopic excision for lumbar disc herniation: Surgical technique, outcome and complications in 307 consecutive cases. *Spine.* 2002;27(7):722-31. <https://doi.org/10.1097/00007632-200204010-00009>.
 24. Häkkinen A, Ylinen J, Kautiainen H, Tarvainen U, Kiviranta I. Effects of home strength training and stretching versus stretching alone after lumbar disk surgery: a randomized study with a 1-year follow-up. *Arch Phys Med Rehabil.* 2005;86(5):865-70. <https://doi.org/10.1016/j.apmr.2004.11.012>.

Author's Contribution

RUR Conceived the idea, made the project plan, carried out data collection and wrote the manuscript. MNK did data collection as per methodology, did data collection and did statistical analysis. MIUH did data collection as per methodology, refined the manuscript. SU did data collection, literature search and bibliography. Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of Interest

Authors declared no conflict of interest

Grant Support and Financial Disclosure

None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.