ORIGINAL RESEARCH

Management of lumbar disc herniationusing percutaneous endoscopic lumbar discectomy

Dr. Devendra Pratap Yadav

Associate Professor, Department of Orthopaedic, Hind Institute of Medical Sciences, Safedabad, Barabanki, UP, India

Corresponding Author

Dr. Devendra Pratap Yadav

Associate Professor, Department of Orthopaedic, Hind Institute of Medical Sciences, Safedabad, Barabanki, UP,

India

Accepted: 26 March, 2017

ABSTRACT

Background: One of the most prevalent and incapacitating spinal conditions documented in medical history is low back and sciatic pain. The present study was conducted to assess efficacy of percutaneous endoscopic lumbar discectomy in management of cases of lumbar disc herniation. **Materials & Methods:** 54 patients of lumbar disc herniation scheduled for percutaneous endoscopic lumbar discectomy were selected. At one month, three months, six months, a year, and then annually after that, clinical follow-up was conducted. The Oswestry Disability Index, visual analog scale, and modified Macnab's criteria were used to evaluate the results. **Results:** Age group 30-40 years had 6 males and 7 females, 40-50 years had 11 males and 10 females, 50-60 years had 10 males and 8 females and >60 years had 3 males and 2 females. The difference was non- significant (P> 0.05). The approachwas transforaminal in 31, interlaminar in 15 and combined in 8 patients. Outcome was excellent in 28, good in 17, fair in 5 and poor in 4 patients. The difference was significant (P< 0.05). **Conclusion:** Lumbar disc herniation can be safely treated with percutaneous endoscopic lumbar discectomy. It has the advantage that it can be performed on a day care basis under local anesthesia with shorter length of hospitalization and early return to work.

Keywords: lumber disc herniation, low back pain, Percutaneous endoscopic lumbar discectomy

Received: 22 February, 2017

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

One of the most prevalent and incapacitating spinal conditions documented in medical history is low back and sciatic pain. One of the main causes of sciatica and back pain is lumbar disc herniation. Almost 80% of people experience low back pain (LBP) at least once in their lifetime.¹ In the USA, LBP costs more over \$100 billion a year because of its high prevalence and substantial contribution to disability. The most frequent cause of the wide range of LBP is intervertebral degeneration, which can result in lumbar disc herniation (LDH) and degenerative disc disease. Therefore, it is crucial to have a thorough awareness of LDH, its causes, and the best ways to treat it.²

An outer annulus fibrosus (AF) and an inner nucleus pulposus (NP) make up the intervertebral disc.³ Collagen secretion and a large number of proteoglycans (PG) in the central NP promote water retention and provide hydrostatic pressure, which prevents the spine from compressing axially.

Percutaneous endoscopic discectomy has replaced exploratory laminectomy as the surgical treatment for lumbar disc prolapse. Results of laminectomy and discectomy for lumbar disc prolapse were initially published by Mixter and Bar.⁴

Yasargil and Caspar pioneered the use of microscopes for posterior discectomy, reducing the amount of skin incision and resulting in minimal scarring on the muscles and epidermis.⁵ Percutaneous endoscopic lumbar discectomy (PELD) preserves spinal stability by approaching the disc posterolaterally through the Kambin triangle without requiring bone or facet removal.⁶The present study was conducted to assess efficacy of percutaneous endoscopic lumbar discectomy in management of cases of lumbar disc herniation.

MATERIALS & METHODS

The present study was carried out on54 patients of lumbar disc herniationscheduled for percutaneous

endoscopic lumbar discectomy. All gave their written consent to participate in the study.

Data such as age, gender, name etc. was recorded. Preoperative X-rays and lumbosacral spine magnetic resonance imaging (MRI) were performed on all patients. At one month, three months, six months, a year, and then annually after that, clinical follow-up was conducted. The Oswestry Disability Index, visual analog scale, and modified Macnab's criteria were used to evaluate the results. Results were studied using student's t test with 0.05 value set at level of significance.

RESULTS

Table I Distribution of patients

Age group (Years)	Male (30)	Female (27)	P value
30-40	6	7	0.84
40-50	11	10	
50-60	10	8	
>60	3	2	

Table I shows that age group 30-40 years had 6 males and 7 females, 40-50 years had 11 males and 10 females, 50-60 years had 10 males and 8 females and >60 years had 3 males and 2 females. The difference was non-significant (P> 0.05).

Table II Assessment of parameters

Variables	Parameters	Number	P value
Approach	Transforaminal	31	0.03
	Interlaminar	15	
	Combined	8	
Outcome	Excellent	28	0.05
	Good	17	
	Fair	5	
	Poor	4	

Table II, graph I shows that approach was transforaminal in 31, interlaminar in 15 and combined in 8 patients. Outcome was excellent in 28, good in 17, fair in 5 and poor in 4 patients. The difference was significant (P < 0.05).





DISCUSSION

A percutaneous endoscopic discectomy has the benefit of causing less harm to the muscles and ligaments, which enables quicker recovery, a shorter hospital stay, and an earlier return to function.⁷ The percutaneous technique presents difficulties for surgeons and PELD, and the learning curve is typically thought to be steep, despite the fact that

numerous studies have demonstrated the effectiveness of PELD with favorable clinical outcomes. Serious side effects include nerve root damage, dural tear, hemorrhage, visceral damage, vascular damage, and infection could happen as a result of inexperienced surgical methods during the learning phase. Type II collagen makes up 20% of the NP's total dry weight and is its main constituent.⁸

The AF, on the other hand, keeps the NP in the middle of the disc with minimal PG; it is mainly made up of concentric type I collagen fibers, which make about 70% of its dry weight.9 The disc protruding through an intact AF, the NP extruding through the AF while still maintaining continuity with the disc space, or the total loss of continuity with the disc space and sequestration of a free fragment are the three possible causes of the shortening of the space available for the thecal sac in LDH.¹⁰ LDH is believed to be caused by a number of alterations in the biology of the intervertebral disc. These include reduced water retention in the NP, increased percent of type I collagen within the NP and inner AF, degradation of collagen and extracellular matrix (ECM) materials, and upregulation of systems of degradation such as apoptosis, matrix metalloproteinase (MMP) expression, and inflammatory pathways.¹¹The present study was conducted to assess efficacy of percutaneous endoscopic lumbar discectomy in management of cases of lumbar disc herniation.

In present study, age group 30-40 years had 6 males and 7 females, 40-50 years had 11 males and 10 females, 50-60 years had 10 males and 8 females and >60 years had 3 males and 2 females. With a oneyear minimal follow-up period, Yeung and Tsou¹² reported the outcomes of posterolateral disc excision in 307 patients. They reported that 10.3 individuals had poor results and 89.7% had excellent results. Two patients experienced deep infection, two developed thrombophlebitis, six experienced dysesthesia, and one patient experienced a dural rupture. Endoscopic discectomy has the advantages of a short hospital stay, low morbidity, and quick recovery, but few randomized control studies have demonstrated that the outcomes of microdiscectomy and endoscopic discectomy are identical. A lengthy learning curve is the primary drawback of percutaneous endoscopic discectomy. This study emphasizes that the learning curve is the reason for the long operating time in the early cases, which necessitates the use of an additional or alternative strategy.

We found that the approach was transforminal in 31, interlaminar in 15 and combined in 8 patients. Outcome was excellent in 28, good in 17, fair in 5 and poor in 4 patients. Acharya et al¹³retrospectively reviewed273 cases of primary and revision lumbar discectomy performed in our institute over a threeyear period. The primary surgery group had 52 (20.08%) contained and 207 (79.92%) extruded or sequestered discs, while the numbers in the revision group were three (21.43%) and 11 (78.57%) respectively. "Satisfactory" outcome was noted in 96.5% of the primary surgeries, with a recurrence rate of 3.5%. In the revision group 78.6% had "satisfactory" outcome. In 9.4% of the primary group had complications, while it was 21.43% in the revision group.

The limitation of the study is small sample size.

CONCLUSION

Authors found that Llumbar disc herniation can be safely treated with percutaneous endoscopic lumbar discectomy. It has the advantage that it can be performed on a day care basis under local anesthesia with shorter length of hospitalization and early return to work.

REFERENCES

- Caspar W. A new surgical procedure for lumbar disc herniation causing less tissue damage through microsurgical approach. In: Wullenweber R, Brock M, Hamer J, Klinger M, Spoerri O, editors. Advances in Neurosurgery. Berlin: Springer-Verlag; 1977. pp. 74– 7.
- 2. Hijikata S. Percutaneous nucleotomy. A new concept technique and 12 years' experience. Clin OrthopRelat Res. 1989;238:9–23.
- 3. Kambin P, Schaffer JL. Percutaneous lumbar discectomy. Review of 100 patients and current practice. Clin OrthopRelat Res. 1989;238:24–34.
- Kambin P, editor. Arthroscopic and Endoscopic Spinal Surgery. 2nd ed. Totowa, New Jersey: Humana Press; 2005. History of surgical management of herniated lumbar discs from cauterization to arthroscopic and endoscopic spine surgery; pp. 1–27.
- Mixter WJ, Barr J. Rupture of the intervertebral disc with involvement of the spinal canal. N Engl J Med. 1934;211:208–15.
- Yasargil MG. Microsurgical operation for herniated lumbar disc. In: Wullenweber R, Brock M, Hamer J, Klinger M, Spoerri O, editors. Advances in Neurosurgery. Berlin: Springer-Verlag; 1977. p. 81.
- Peng CW, Yeo W, Tan SB. Percutaneous endoscopic lumbar discectomy: Clinical and quality of life outcomes with a minimum 2 year follow-up. J OrthopSurg Res. 2009;4:20.
- Mayer HM, Brock M. Percutaneous endoscopic discectomy: Surgical technique and preliminary results compared to microsurgical discectomy. J Neurosurg. 1993;78:216–25.
- Hermantin FU, Peters T, Quartararo L, Kambin P. A prospective, randomized study comparing the results of open discectomy with those of video-assisted arthroscopic microdiscectomy. J Bone Joint Surg Am. 1999;81:958–65.
- Lee DY, Shim CS, Ahn Y, Choi YG, Kim HJ, Lee SH. Comparison of percutaneous endoscopic lumbar discectomy and open lumbar microdiscectomy for recurrent disc herniation. J Korean Neurosurg Soc. 2009;46:515–21.
- Chae KH, Ju CI, Lee SM, Kim BW, Kim SY, Kim HS. Strategies for non-contained lumbar disc herniation by an endoscopic approach: Transforaminal suprapedicular approach, semi-rigid flexible curved probe, and 3-dimensional reconstruction CT with discogram. J Korean Neurosurg Soc. 2009;46:312–6.
- 12. Yeung AT, Tsou PM. Posterolateral endoscopic excision for lumbar disc herniation: Surgical technique, outcome, and complications in 307 consecutive cases. Spine (Phila Pa 1976) 2002;27:722–31.
- Acharya KN, Nathan TS, Kumar JR, Menon KV. Primary and revision lumbar discectomy: A three-year review from one center. Indian J Orthop. 2008;42:178– 81. doi: 10.4103/0019-5413.40254.