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ORIGINAL ARTICLE

Efficacy of percutaneous endoscopic lumbar discectomy in management of cases of lumbar disc herniation

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ABSTRACT:

Background: Low back and sciatic pain have been one of the most common and disabling spinal disorders recorded in medical history. Lumbar disc herniation is a major cause of back pain and sciatica. The present study was conducted to assess efficacy of percutaneous endoscopic lumbar discectomy in management of cases of lumbar disc herniation. **Materials & Methods:** 48 patients of lumbar disc herniation were selected for percutaneous endoscopic lumbar discectomy. All patients were exposed to preoperative X-rays and magnetic resonance imaging (MRI) scans of lumbosacral spine. Clinical follow up was done at 1 month, 3 months, 6 months, 1 year, and at yearly interval thereafter. **Results:** Age group 30-40 years had 5, 40-50 years had 11, 50-60 years had 12 and >60 years had 20 patients. The difference was significant (P< 0.05). Approach was transforaminal in 30, interlaminar in 13 and combined in 5. Outcome was excellent in 22, good in 15, fair in 8 and poor in 3. The difference was significant (P< 0.05). **Conclusion:** Percutaneous endoscopic lumbar discectomy is a safe technique in management of cases of lumber disc herniation.

Key words: lumber disc herniation, Percutaneous endoscopic lumbar discectomy, spinal disorders

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INTRODUCTION

Low back and sciatic pain have been one of the most common and disabling spinal disorders recorded in medical history. Lumbar disc herniation is a major cause of back pain and sciatica. Nearly 80% of the population sustains an episode of low back pain (LBP) once during their lifetime.[1] Due to its high prevalence and significant contribution to disability, LBP incurs an annual cost exceeding $100 billion in the USA. Within the vast differential of LBP, the most common source is intervertebral degeneration leading to degenerative disc disease and lumbar disc herniation (LDH). Thus, an effective understanding of LDH, its origins, and how to appropriately treat LDH is of substantial importance.[2]

The intervertebral disc consists of an inner nucleus pulposus (NP) and an outer annulus fibrosus (AF). The central NP is a site of collagen secretion and contains numerous proteoglycans (PG), which facilitate water retention, creating hydrostatic pressure to resist axial compression of the spine.[3] The surgical management of lumbar disc prolapse has evolved from exploratory laminectomy to percutaneous endoscopic discectomy. Mixter and Bar first published results of laminectomy and discectomy for lumbar disc prolapse.[4] Yasargil and Caspar started the use of microscopes for posterior discectomy which limited the skin incision and lead to less muscle and epidural scarring. In percutaneous endoscopic lumbar discectomy (PELD), the disc is approached postero-laterally through the triangle of Kambin without the need for bone or facet resection thus preserving spinal stability.[5] The 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 comprised of 48 patients of lumbar disc herniation who were selected for percutaneous endoscopic lumbar discectomy. Patients with lumbar disc prolapse with failed conservative treatment of 6 weeks duration, patients with disc prolapse with neurologic deficit, and patients with Cauda equina syndrome were part of the study. There were 28 males and 20 females in present study. All after obtaining written consent were included in the study.

Data such as age, gender, name etc. was recorded. All patients were exposed to preoperative X-rays and magnetic resonance imaging (MRI) scans of lumbosacral spine. Clinical follow up was done at 1 month, 3 months, 6 months, 1 year, and at yearly interval thereafter. The outcome was assessed using modified Macnab's criteria, visual analog scale, and Oswestry Disability Index. Results were studied using student's t test with 0.05 value set at level of significance.

RESULTS

Table I Age wise distribution

Age group (Years)	Number	P value
30-40	5	0.021
40-50	11	
50-60	12	
>60	20	

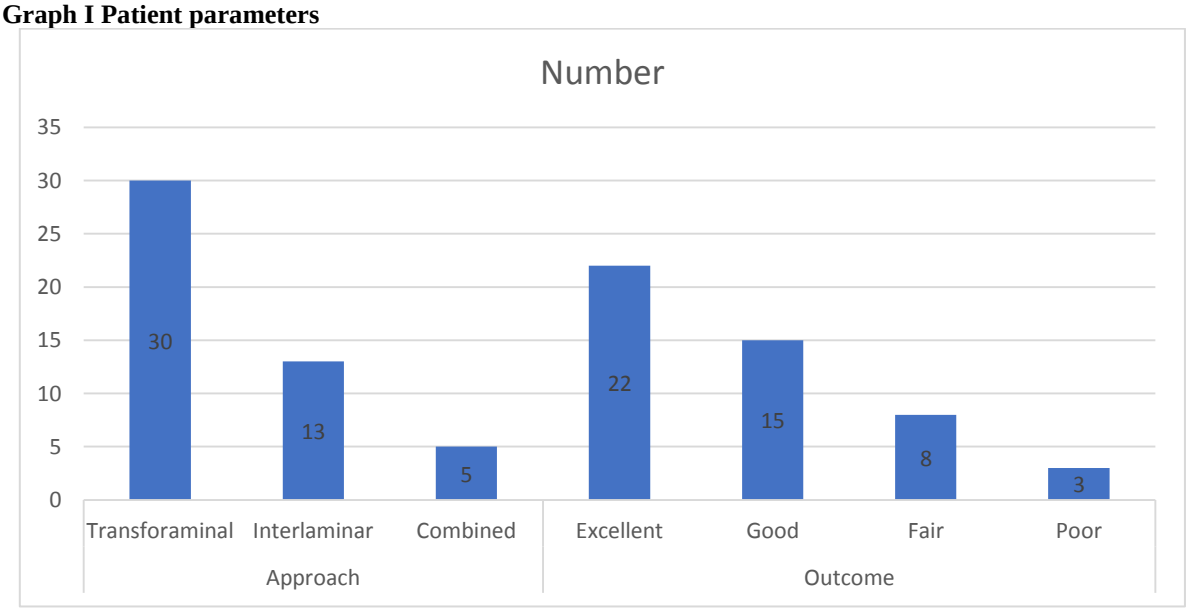
Table I shows that age group 30-40 years had 5, 40-50 years had 11, 50-60 years had 12 and >60 years had 20 patients. The difference was significant (P< 0.05).

Table II Patient parameters

Variables	Parameters	Number	P value
Approach	Transforaminal	30	0.01
	Interlaminar	13	
	Combined	5	
Outcome	Excellent	22	0.02
	Good	15	
	Fair	8	
	Poor	3	

Table II, graph I shows that approach was transforaminal in 30, interlaminar in 13 and combined in 5. Outcome was excellent in 22, good in 15, fair in 8 and poor in 3. The difference was significant (P< 0.05).

Graph I Patient parameters



DISCUSSION

The advantage of a percutaneous endoscopic discectomy is that there is less damage to muscular and ligamentous structures allowing for faster rehabilitation, shorter hospital stay, and earlier return to function.[6] Although many studies have shown the efficacy of PELD with good clinical outcome, the percutaneous approach poses challenges to surgeons and the PELD, the learning curve is usually perceived to be steep.[7] Major complications such as nerve root injury, dural tear, haematoma, visceral injury, vascular injury, and infection may occur, possibly resulting from lack of skilled surgical techniques during the learning period. The NP is primarily composed of type II collagen, which accounts for 20% of its overall dry weight.[8] In contrast, the AF functions to maintain the NP within the center of the disc with low amount of PG; 70% of its dry weight is comprised of primarily concentric type I collagen fibers. In LDH, narrowing of the space available for the thecal sac can be due to protrusion of disc through an intact AF, extrusion of the NP through the AF though still maintaining continuity with the disc space, or complete loss of continuity with the disc space and sequestration of a free fragment.[9]

Several changes in the biology of the intervertebral disc are thought to contribute to LDH. 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.[10] The 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 5, 40-50 years had 11, 50-60 years had 12 and >60 years had 20 patients.

Garg et al compared the outcomes of microendoscopic discectomy (MED) versus open discectomy for lumbar disc herniation. 80 men and 32 women aged 26 to 57 (mean, 37) years with a single-level disc herniation were randomised to undergo MED (n=55) or open (fenestration/laminotomy) discectomy (n=57). Patients were assessed pre- and post-operatively (at week 6, month 6, and year one). The 2 groups were compared with respect to surgical time, anaesthesia time, duration of hospital stay, intra-operative blood loss, weight of disc material removed, and self-evaluated low back pain and functional outcome (using the Oswestry low back pain disability questionnaire). Results showed that Surgical and anaesthesia times were significantly longer, but blood loss and hospital stay were significantly reduced in patients having MED than open discectomy. The improvement in the Oswestry score in both groups was significant at week one, but not at other follow-ups. The complication rate was similar in both groups. One patient with MED had a recurrence of disc herniation after 7 months and was treated with open discectomy. Authors concluded that both methods are equally effective in relieving radicular pain. MED entailed shorter hospital stay, less morbidity, and earlier return to work. Nonetheless, it is a demanding technique and should not be attempted without specific instruction and training.[11]

We found that approach was transforaminal in 30, interlaminar in 13 and combined in 5. Outcome was excellent in 22, good in 15, fair in 8 and poor in 3. The primary signs and symptoms of LDH are radicular pain, sensory abnormalities, and weakness in the distribution of one or more lumbosacral nerve roots. Focal paresis, restricted trunk flexion, and increases in leg pain with straining, coughing, and sneezing are also indicative. Patients frequently report increased pain when sitting, which is known to increase disc pressure by nearly 40%. The affect dermatome varies based on level of herniation as well as herniation type. In paracentral herniations, the transversing nerve root is affected versus in far lateral herniations, the exiting nerve root is affected. For example, a paracentral herniation at L4-5 would cause L5 radiculopathy whereas a far lateral herniation at the same level would cause L4 radiculopathy.[12]

Yeung and Tsou[13] described results of posterolateral disc excision in 307 patients with minimal follow-up period of 1 year. They reported satisfactory result rate in 89.7% and poor results in 10.3 patients. The complications were deep infection in two, thrombophlebitis in two, dysesthesia in six, and dural tear in one patient. Few randomized control studies have shown that the results of microdiscectomy and endoscopic discectomy are the same, but the endoscopic surgery has the advantages of short hospital stay, low morbidity, and rapid recovery. The main disadvantage of percutaneous endoscopic discectomy is a long learning curve. Long operating time in the initial cases need for alternate or additional approach as highlighted in this study is due to learning curve. However, the learning curve is not long as it was presumed earlier.[14] Schaffer et al reported that the most common causes of hernia recurrence were lateral recess stenosis, sequestered herniation and improper placement of the working instruments.[15]

The effect of day surgery is indistinguishable from that of nonday surgery. Therefore, the length of hospitalization was not related to the outcome of surgery. The main factors affecting the outcome of surgery may be related to the operator's operation. However, a limitation of this study is the lesser number of cases.

CONCLUSION

Authors found that percutaneous endoscopic lumbar discectomy is a safe technique in management of cases of lumber disc herniation.

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