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Original Article

Short Term Clinical Outcome of Micro Lumbar Discectomy in Tertiary Care Center

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Abstract

Background
Minimal invasive open lumbar microdiscectomy has been associated with good success rate and low morbidity. The present study is aimed to evaluate the clinical outcome of patients who underwent open minimal invasive open lumbar microdiscectomy for herniated intervertebral disc.

Materials and Methods
This is a prospective observational hospital based study of prolapsed lumbar intervertebral disc operated in the department of neurosurgery at Nobel Medical College Teaching Hospital, Biratnagar, Nepal from January 2018 to June 2021. All patients of lumbar herniated intervertebral disc subjected for surgery were included. Recurrent prolapsed intervertebral disc, Disc surgery requiring stabilization was excluded from the study. During surgery types of prolapsed intervertebral disc, level and operative time were noted. In the post-operative period Visual Analogue Scale was used to assess the change in severity of pain. Duration of hospital stay and the complications occurred were also noted.

Results
The mean age of the study population was was 41.50 (±14.56) years ranging from 20 years to 79 years. The commonest lumbar prolapsed intervertebral disc was at L4-L5 level. The mean operative time was 42 minutes excluding the time for anaesthesia preparation. There was statistically significant difference ($p<0.001$) in pre-operative and post-operative Visual Analogue Scale. Mean duration of hospital stay was 5.58 (1.87) days.

Conclusion
A through workup and surgical planning is associated with better outcome avoiding complications in minimal invasive open micro lumbar discectomy.

Keywords: *Back Pain, Disc herniation, Sciatica*

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Introduction

Low back pain is the common presenting complains of people presenting in primary care clinician [1]. Among the causes of low back pain, lumbar disc herniation is the common pathology. Herniated lumbar disc is a displacement of disc material (nucleus pulposus or annulus fibrosis) beyond the intervertebral disc space [2]. Patients with herniated disc presents with radiculopathy, mylopathy or myloradiculopathy depending up on the level and types of herniated disc. Initial treatment is medical.However surgery is indicated in resistant case or with focal defecits. Among many surgical options minimally invasive open lumbar discectomy (MIOLD) is one of the options which is alternative to microlumbardisectomy [3]. MIOLDis associated with low postoperative morbidity.It is commonly done for lumbar radicular pain and the success rates following the surgery have been reported high ranging from 50-98% [4]. Newer surgical techniques in the operation theatre like digital fluoroscopy, navigation system and high resolution endoscopy have helped for the advancement [5]. However, the MIOLD is rewarding. It is minimally invasive open procedure of discectomy with relatively high rate of patient satisfaction [3]. As it is minimal invasive surgery, post-operative pain at wound site is very less. Patient can be early ambulated after recovery from general anaesthesia. This helps the patients for early recovery. In the present study, we aimed to detail about our experience of minimally invasive open microlumbar discectomy in terms of operative details, clinical findings postoperative patients satisfaction translated in term of Visual Analogue Scale (VAS), duration of hospital stay and early complications.

Materials and Methods

This is a cross-sectional observational study conducted in the department of Neurosurgery at Nobel Medical College and Teaching hospital, Biratnagar Nepal from January 2018 to June 2021 after getting the approval of institutional review committee of the institute. All patients of single level lumbar herniated intervertebral disc subjected for surgery were included. Recurrent PIVD, Multilevel discectomy, Disc surgery requiring stabilization were excluded from the study. During surgery, types of PIVD (Central, Lateral Extrude and Sequestration), level of PIVD, operative time was noted. In the post-operative period Visual Analogue Scale (VAS) was used to assess the change in severity of pain [6]. Duration of hospital stay and the complications occurred were also noted. Patients preoperative VAS and Post-operative VAS was compared for patient'spain assessment as primary outcome.Preoperative patient's level of PIVD was reconfirmed with magnetic resonance imaging (MRI) and required routine preoperative investigation was obtained along with the written consent. The associated risk and options of treatments were well explained. Operative procedural steps were done as described by Devkota et al [3] where the subjected cases were operated viapara median incision without cutting the muscle under high resolution microscope by senior consultant neurosurgeon who is well exposed in spinal surgery. Post-surgery patient were mobilized on the day of surgery and analgesic were given for 24 hours and then on the basis of patients demand. Considering the patients comfort and their fear after surgery most of the patients were discharged after suture removal on seventh postoperative day. Early complications like dural tear, post-operative CSF leak, wound infection and discitis were recorded .All the data collected were digitally transferred in to word excel window 2010 andanalyzed. The p value of<0.05 was considered significance. Wilcoxon Signed Rank Test was used to calculate the p value.

Results

During the study period total of 40 cases that were resistant to conservative nonoperative treatment and met the inclusion criteria were Studied. The majority (67.5%) of the patients was

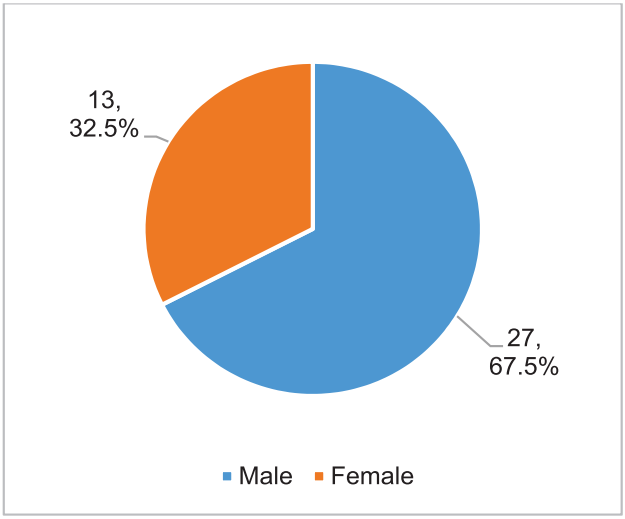

Figure 1: Sex distribution in the present study

male (Figure 1). The male to female ratio was 2.07:1.The mean age of the study population was 41.50 (±14.56) years ranging from 20 years to 79 years. Most of the patients presented with PIVD at L4-L5 among whom each had cauda equina and sequestration respectively and seven had radiculopathy (Figure 2). There was statistically significant difference (p<0.001) in pre-operative and post-operative VAS scores. Post-operative VAS scores were significantly lesser than pre-operative VAS scores (Table 1).

The mean duration of hospital stay for the patients was 5.58 (1.87) days with mobilization at 5.18 (1.84) days (Table 2). Majority (87.5%) patients reported having used post-operative analgesics at 48 hours (Figure 3).

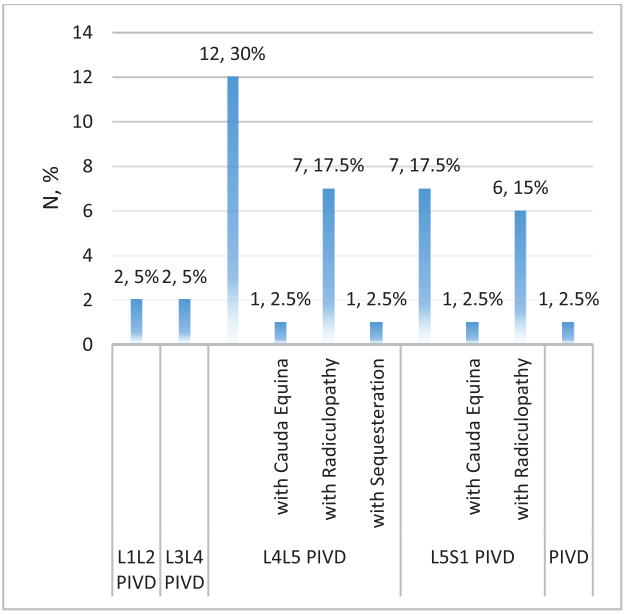

Figure 2: Level of Lumbar PIVD in the present study

Table 1: Comparison of Pre-operative and Post-operative VAS score.

	VAS scores		Difference in scores		Test statistic	Standard Error	p-value
	Mean (SD)	Median (IQR)	Mean (SD)	95% CI			
Pre-operative	9.00 (0.85)	9 (7 – 10)	6.86 (0.82)	6.61 – 7.14	0.000	73.142	<0.001*
Post-operative	2.13 (0.97)	2 (1 – 4)					

*Wilcoxon Signed Rank Test; p<0.05 signifies statistical significance

Table 2: Post procedural outcomes for MIOLD (in days)

	Mean (SD)	Median (IQR)
Duration of Hospital stay	5.58 (1.87)	5 (3 – 10)
Mobilisation	5.18 (1.84)	5 (3 – 12)

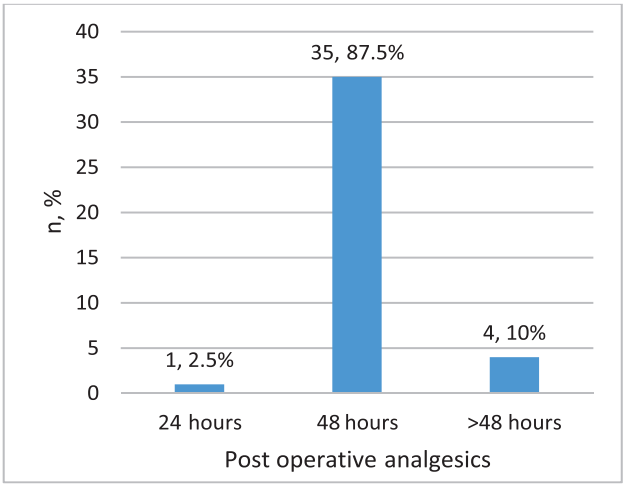

Figure 3: Requirement of analgesia in postoperative period

The mean operative time was 42 minutes which excluded the time taken for anesthetic preparation pre skin incision and after the closure of skin incision.

Discussion

Lumbar discectomy is one of the most common surgical procedures. It can be done in various ways ranging from open to endoscopic. Discectomy procedure has come a long way since its first microscopic surgery performed by Yasargil in 1968 [7] and endoscopic discectomy, first performed by Schreiber and Suezawa in 1986 and improved by Mayer, Brock, and Mathews [8-10]. Due to refinement in skills and advancement in technology MIOLD has become a day care surgery. Microdiscectomy is still the standard method of treatment due to its simplicity, low rate of complications and high rate of satisfactory results, which exceed 90% in the largest series [11]. Nonetheless spine surgery has not been a day care surgery in our center. Thereasons for this are multifactorial. Firstly, the unavailability of trained spine Neurosurgeon, high yield microscope and associated instruments. Lastly the patients' perception and fear of spine surgery in our part is same as of the world. There is a misconception in many patients with spinal issue be it a degenerative spine or tumor or trauma. The common misperception is being paraplegia in spinal surgery. Despite being the day care procedure in other part of the world, the median duration of hospital stay in our study was five days rangingfrom three to ten days which was similar to the study conducted by Shikhar D Singh et al [12]. In this study, mean age of the patient was 41.50 years with minimum 20 years and maximum 79 years. Among them majority were male (67.5%). In the study by Majeed *et. al.*

mean age was 37.50 years. Most commonly involved segment of PIVD was L4 L5 level and common neurological involvement were caudae-quina and radiculopathy [13]. In the present study, the preoperative mean VAS was 9 and the post operative mean VAS was 2.13 which was statistically significant.In the study by Mashhadinezhad et al [14], it was seen that there was a significant improvements in preoparative and post operative VAS. The p value achieved in VAS scores for back (P=0.197) and radicular pain (P=0.606) were seen.The average operative time was 42 minutes in the present study which was similar in the study by Devkota *et. al.* where the average time surgery was between 30-60 minutes[3]. The types of disc herniation have significant impact on its functional outcome after surgery [15]. Small annular tears with large disc fragments have shown to be associated with the better surgical outcomes and lessrecurrence of disc herniation. Avoiding wrong level surgery while performing a single level lumbar discectomyis is very important [16]. It is difficult to exactly depend on the preoperative marking X-ray for the confirmation of the level of surgery. It becomes more difficult due to thelordotic lumbar spine that too the surgery in prone position. Having Navigation is of very useful tool in this scenario where navigation system is not available in all the centers due to technical and financial constraints.So having computed tomography scan (CT) isof more helpful in identifying the correct level and for the proper surgical exposure. In the present study there wereno major complications noted. There was one diabetic female patient who developed discitis after 2 weeks of surgery. Sherecovered completely in four weeks (after 2 weeks IV antibiotics followed by 2 weeks of oral antibio-tics).She did not require surgical intervention. In a study by Basu S *et. al.*, it was seen that five out of 17 (29%) patients presented with symptoms of discitis in the first 2 weeks and 3 patients out of these 5 were diabetic [17]. It also shows that comorbid conditions like having diabetes increa-ses the chances of discitis. Second case there was CSF leak noted on 5th post-operative day. She did not respond to the conservative treat-ment of 2 weeks. She was taken to theatre and repaired the dural tear and plugged and packed with fibrin flue and subcutaneous fat. In a study by Brisby H *et. al.* the chances of dural tear leading to CSF leak in anelective spinedisectomy is around 1% in cervical spine and higher in thoracic and Lumbar level [18]. Considering with this literature incidence of dural tear in our series is 2.5%. There was no mortality in the present study.

Conclusion

Surgery for the herniated lumbar disc is a common surgical procedure. The MIOLD is minimally invasive procedure which is easy, less time consuming with high success rate and less morbidity. It facilitates early ambulation and shortens the duration of hospital stay.

Limitations of the study

It is single center study. Sample size is less. The result of the present study needs to further strengthen by involving multiple centers and large number of study population.

Conflicts of interests: None

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