

Original Article**Lumbar Intervertebral Disc Prolapse (PLID) Surgery under SAB**Khan MRN¹, Ahmed MT², Ahmed MU³

Conflict of Interest: There is no conflict of interest relevant to this paper to disclose.

Funding Agency: Was not funded by any institute or any group.

Contribution of Author: Principal Investigator- Dr. Md. Rashidooon Nabi Khan

Manuscript Preparation- Dr. Md. Rashidooon Nabi Khan & Dr. Mesbah Uddin Ahmed

Data Collection- Dr. Md. Rashidooon Nabi Khan & Dr. Mostafa Taufiq Ahmed

Editorial Formatting: . Md. Rashidooon Nabi Khan & Dr. Mesbah Uddin Ahmed

Copyright: @2021bang.BJNS published by BSNS. This published by BJNS. This article is published under the creative commons CC-BY-NC license. This license permits use distribution (<http://creativecommons.org/licenses/by-nc/4.0/>) reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

Received: 03 February, 2021

Accepted: 09 May, 2021

Abstract

Background: The type of surgery performed on the spine encompasses operations for trauma, deformity, and myelopathy. The complexity of procedures is continuing to increase and older patients with significant co-morbidities are being offered ever more major procedures for which they would have previously not been considered. Developing areas include surgery for degenerative scoliosis and an increase in operations performed on the anterior lumbar spine Spinal anaesthesia for Lumbar Intervertebral Disc Prolapse (PLID) surgery is becoming increasingly more popular because this anaesthetic technique allows the patient to comfortable self-position and avoid neurological injury that may occur with prone positioning under general anaesthesia. PLID surgery is also a comparatively cost effective surgical procedure.

Aim of the study: The aim of the study was to observe the extent of surgical options as per pathological outcome in terms of postoperative pain, immediate functional recovery and patient's satisfaction for undergoing PLID surgery under spinal anaesthesia. **Methods:** This observation study was conducted in the department of Neuro surgery Sylhet MAG Osmani Medical College Hospital in association with Central Hospital Limited Sylhet from January 2007 to July 2019. A total of 4000 healthy co-operative patients with ASA I-III grading, undergoing Lumbar Intervertebral Disc Prolapse (PLID) surgery at single level to two levels also recurrent cases operative maximum twice previously were selected as study population. A comprehensive perioperative was carried out documenting per operative events anaesthetic complications, pace of physiological and functional recovery and patient's satisfaction. Variables were recorded as pain level using a visual analogue scale (VAS) at 1, 6, 12 & 24 hours; patients level of satisfaction during the stay on the ward using verbal rating scale (VER); during of surgery; per amount of blood loss. Data were analyzed by SPSS version 19.0. **Results:** Among 4000 participants, man was 2416(60.4%) and female 1684 (39.6%). In incidence of PLID surgery 36-45 years age group was almost fifty percent 49.42%. In level of PLID L3/4 was highest 39.0%. Regarding of per operative blood, new was 3337(84.18%) & mean value was 47.65(±9.14) and recurrent 633(15.82%) & mean value was 55.60(±13.80). In duration of surgery the mean of new was 22.51(±3.67)& recurrent 26.72(±5.78). Regarding per operative complications, hypertension was highest 1440(36.0%) followed by hypotension 992(24.4%) & nausea/vomiting 960(24.0%). Average hospital stay was 36 to 48 hours. **Conclusion:** As our results correspond to the others available studies it is clear that, spinal anaesthesia can be definitely used for doing at least 2 levels of PLID surgery as it is also more cost effective and patient need to stay minimum in time duration.

Keywords: Intervertebral Disc Prolapse (PLID) surgery, Spinal anaesthesia

Bang. J Neurosurgery 2022; 11(2): 75-79

1. Dr. Md. Rashidooon Nabi Khan, Associate Professor, Department of Neuro Surgery, Sylhet, MAG Osmani Medical College and Hospital, Sylhet, Bangladesh
2. Dr. Mostafa Taufiq Ahmed, Assistant Professor, Department of Neuro Surgery, Sylhet, MAG Osmani Medical College and Hospital, Sylhet, Bangladesh
3. Dr. Mesbah Uddin Ahmed, Indoor Medical Officer, Clinical Neuro Surgery, National Institute of Neuro Sciences & Hospital, Dhaka, Bangladesh

Address of Correspondence: Dr. Md. Rashidooon Nabi Khan, Associate Professor, Department of Neuro Surgery, Sylhet, MAG Osmani Medical College and Hospital, Sylhet, Bangladesh. E-mail: mdrnabikhan@gmail.com

Introduction:

Surgical management of a prolapsed lumbar disc was first described by Mixter and Barr in 1934¹. Now a days, surgical options ranging from fenestration & discectomy to laser disc decompression as per proper indications, patients & surgeon's choice as well as facilities available at a neurosurgical centers. Different anaesthetic techniques have been used for lumbar spinal surgery. In this study apparently healthy and co-operative group of patients undergoing PLID surgery under spinal anaesthesia, as per patient's fitness & individual preference of the surgeon & Anaesthetist. Patients may favor general anaesthesia (GA) due to traditional considerations of being completely pain free during the surgery and also unaware of the procedure. Spinal anaesthesia (SA) for PLID surgery is becoming increasingly more popular because this anaesthetic technique allows the patient to comfortable self-position and avoid neurological injury that may occur with prone positioning under general anaesthesia. Spinal anaesthesia reduces intraoperative surgical blood loss, improves perioperative haemodynamic stability and reduces pain in the immediate postoperative period^{2,3}. This leads to a reduced need for analgesics and a reduction in the incidence of nausea and vomiting in the postoperative period. Spinal anaesthesia for PLID surgery also decreases the incidence of lower extremity thrombo-embolic complications and does not increase the occurrence of problems with micturition. These benefits increase the patient's satisfaction, and they expedite discharge of the patient from the hospital^{4,5}. Several studies have compared both anaesthetic techniques by measuring physiological variables. Study by Dagher et al² shows SA patients performing better from the functional recovery point of view and scoring better pain level. The only other recent reports involving large numbers of patients are from Jellish et al.³ in the USA. Similarly there are significant differences in the level of comfort, SAB patients reporting a better level of comfort in general, similar studies reported by J. Perez Rodriguez et al⁴. In our country there was one study comparing immediate postoperative outcome of SAB & GA on patients undergoing PLID surgery revealed, spinal anaesthesia ensures better operating conditions, better postoperative pain control and a quicker postoperative recovery when compared to general anaesthesia for single level lumbar spine surgery. In our study we have compared patient satisfaction & other variable related to various surgical options for various

levels of PLID with or without LCS under spinal anaesthesia in patients who underwent PLID surgery. The aim of the study was to observe the extent of surgical options as per pathological levels with perioperative outcome in terms of postoperative pain, immediate functional recovery and patient's satisfaction for patients undergoing PLID surgery under spinal anaesthesia.

Material & Method:

This observational study was conducted in the department of Neuro surgery Sylhet MAG Osmani Medical College Hospital in association with Central Hospital Limited Sylhet from January 2007 to July 2019. A total of 4000 healthy co-operative patients with ASA I-III grading, undergoing Lumbar Intervertebral Disc Prolapse (PLID) surgery at single level to two levels also recurrent cases operative maximum twice previously were selected as study population. A comprehensive perioperative was carried out documenting per operative events anaesthetic complications, pace of physiological and functional recovery and patient's satisfaction. Variables were recorded as pain level using a visual analogue scale (VRS) at 1, 6, 12 & 24 hours; patients level of satisfaction during the stay on the ward using verbal rating scale (VER); during of surgery; per amount of blood loss. Data were analyzed by SPSS version 19.0.

Results:

Table-I

Demographic profile of the participants (N=4000)

Gender	n	%
Male	2416	60.4
Female	1584	39.6

Table 1 showed among 4000 participant male was 2416(60.4%) and female 1584(39.6%).

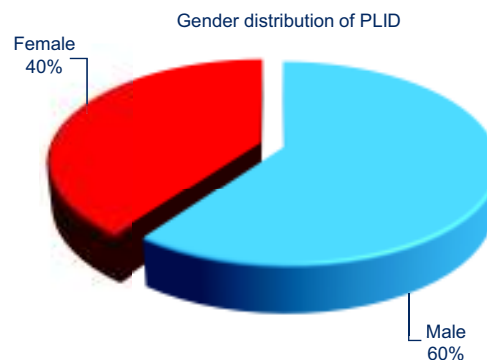


Fig.-1: Gender distribution of PLID (n=4000)

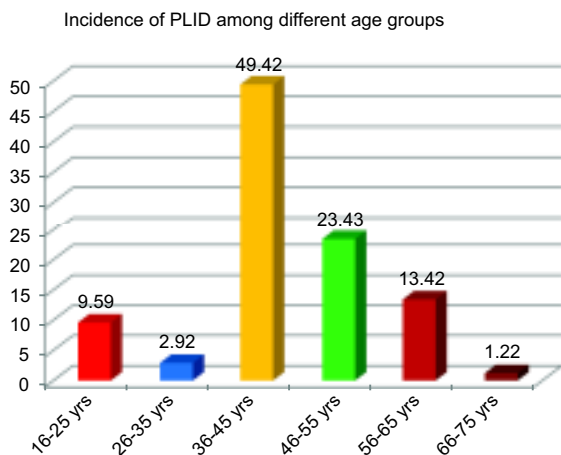


Fig.-2: Incidence of PLID among different age groups (n=4000)

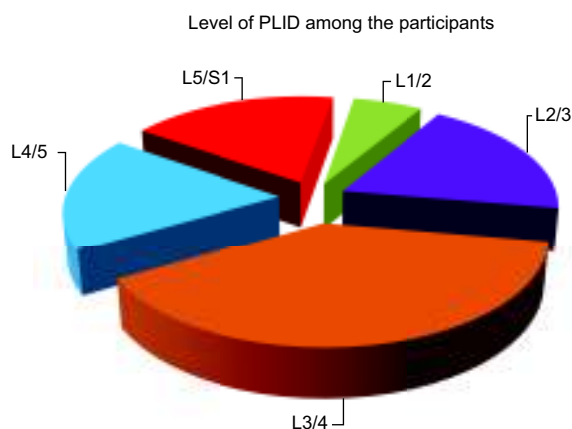


Fig.-3: Level of PLID among the participant's

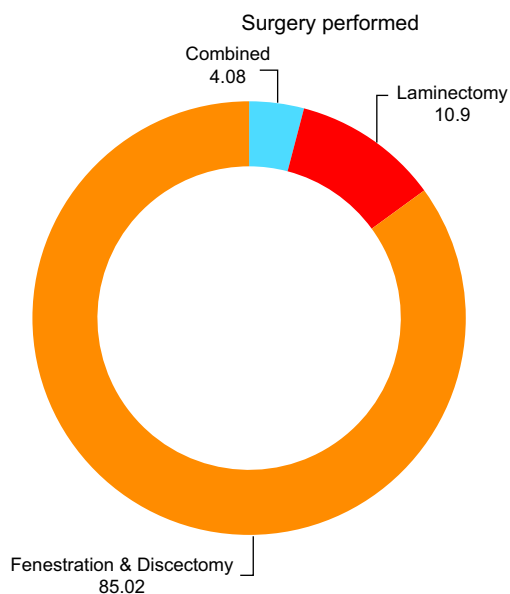


Fig.-4: Surgery performed among the participant's

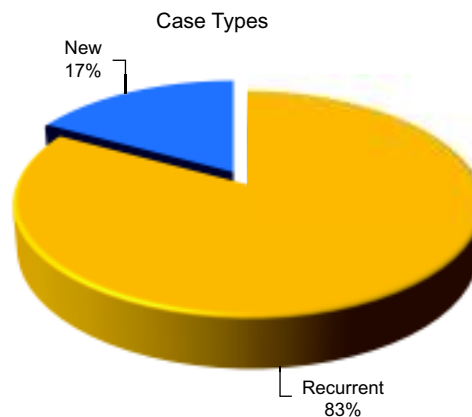


Fig.-5: Case types of the participant's

Table-II
Amount of per operative blood loss (N=4000)

Case types	n	%	Mean (ml)
New	3337	84.18%	47.65(±9.14)
Recurrent	633	15.82%	55.60(±13.80)
Total	4000	100.0%	48.97(±10.49)

Table III showed regarding per operative blood loss, out of 4000 participants, 3337 (84.18%) were new & 633(15.82%) were recurrent cases and the mean value was 47.65 (±9.14) & 55.60 (±13.80) respectively.

Table-III
Duration of surgery (n=4000)

Case types	n	%	Mean (minutes)
New	3337	84.18%	22.51(±3.67)
Recurrent	633	15.82%	26.72(±5.78)
Total	4000	100.0%	23.21(±4.38)

Table 4 showed regarding surgery duration, 3337 (84.18%), 633(15.82%) were new & recurrent cases and mean value was 22.51(±3.67) & 26.72(±5.78) respectively.

Table-IV
Per operative complication (n=4000)

Per operative complications	n	%
Hypotension	992	24.8
Bradycardia	0	0.0
Hypertension	1440	36.0
Nausea/vomiting	960	24.0
Tachycardia	488	12.2
Shivering	586	14.65

Table V showed regarding per operative complications, 992(24.8%), bradycardia 0(0.0%), hypertension 1440(36.0%), nausea/vomiting 960(24.0%), tachycardia 488(12.2%) & finally shivering 586(14.65%).

Table-V

Assessment of visual analogue scale (n=4000)

Time of Assessment VAS	Mean (score)
1 st hour	25.78 (\pm 2.34)
6 th hour	34.14 (\pm 2.30)
12 th hour	30.43 (\pm 2.25)
24 th hour	31.33 (\pm 3.28)

Table showed mean value of VAS assessment, 1st hour 25.78 (\pm 2.34), 6th hour 34.14 (\pm 2.30), 12th 30.43 (\pm 2.25) and finally 24th hour was 31.33 (\pm 3.28).

Table-VI

Post-operative comfort level assessment by VRS (n=4000)

Level of comfort	n	%
Excellent	1920	48.0
Good	1600	40.0
Fair	480	12.0
Poor	0	0.0%

Table VI showed regarding comfort level assessment by VRS, excellent 1920 (48.0%), good 1600(40.0%) and fair 480 (12.0%). No poor comfort level was claimed of the participants.

Discussion:

Different anaesthetic techniques have been used for lumbar spinal surgery. In this study apparently healthy and co-operative group of patients undergoing PLID surgery under spinal anaesthesia, as patient's fitness & individual preference of the surgeon & Anaesthetist. General and spinal anaesthesia are both used for lumbar spine surgery. SA seems to be superior to GA in terms of postoperative pain and in decreasing perioperative undesirable results. However, no studies in the English literature have compared patient satisfaction evaluating functional recovery variables^{1, 6}. A previous study by Dagher et al² shows similar results with SAB patients performing better from the functional recovery point of view and scoring better pain level. The only other recent reports involving large numbers of patients are from Jellish et al. ³ in the USA. In our study SA has demonstrated to be superior to GA from the patient's

satisfaction point of view. Pain level reported by GA patients was always higher than SAB patients and the difference was especially significant at 8 hours. Similarly there are significant differences in the level of comfort, SAB patients reporting a better level of comfort in general, similar studies reported by J. Perez Rodriguez et al⁴. According VAS Score GA reported higher level of pain with similar significance at 1, 6, 12 and 24 hours. There is no significant difference between gender and level of pain. Direct relation between the age of the patient and the level of pain was found, especially in the SAB group, with a higher level of pain in older patients⁸. Spinal anaesthetic patients reported a less incidence of urinary retention, which differs with previous studies where both anaesthetic techniques have been compared^{5,7}. Blinded to an extent by not having experienced the alternative, both groups appeared satisfied with their anaesthetic. However the level of satisfaction was significantly higher in the SAB. Spinal anaesthesia ensures better operating conditions, better postoperative pain control and a quicker postoperative recovery when compared to general anaesthesia for single level lumbar spine surgery. Spinal anaesthesia was as safe and effective as general anaesthesia for patients undergoing lumbar laminectomy. Potential advantages of spinal anaesthesia include a shorter anaesthesia duration, decreased nausea, antiemetic and analgesic requirements, and fewer complications. Usually 90% of the patients become symptom-free by conservative treatment in the form of pelvic traction and exercise ⁷. If conservative treatment fails, the next consideration is surgical intervention. Both the surgeon and the patient must realize that disc surgery is not a cure, only can provide symptomatic relief. It neither stops the pathological process that allows herniation to occur nor restores the back to a normal state. Patient must practice good posture and body mechanics after surgery. The key to the good result of disc surgery is appropriate patient selection. The optimum patient is one with unilateral leg pain extending below the knee that has been present at least for 6 weeks. The pain should have been decreased by rest and anti-inflammatory medication but should have returned to the initial level after a minimum of 6 weeks of conservative treatment.⁸ Physical examination should reveal signs of sciatic irritation and possibly objective evidence of localizing neurological impairment. CT, MRI or myelography should confirm the level of involvement consistent with patient's examination findings. PLID

surgery is not a routine surgery. Proper selection of the patient must be done before going to operation. Simple indentation by the disc in MRI or myelogram is not the indication for surgery. Clinical correction must be done before operation for good result. Psychiatric evaluation should also be done before surgery. From our study we can conclude that if the patients are selected properly, operated classically, managed appropriately after operation and discharged with required advice, classical discectomy can give good result.

Conclusion and Recommendations

As our results correspond to the others available studies it is clear that, spinal anaesthesia can be definitely used for doing at least 2 levels of PLID surgery as it is also more cost effective and patient need to stay minimum in time duration.

Considering all variables cost effective and less time consuming in hospital stay, spinal anaesthesia surgery technique is better than traditional general anaesthesia.

Limitation of the study

Though it was a single center study, for better result multi-center study is needed in future for concrete decision of the researchers.

References:

1. Mixter WJ, Barr JS: Rupture of the intervertebral disc with involvement of the spinal canal. *N Engl Med*, 1934; 211:210-215
2. Dagher C, Naccache N, Narchi P, Hage P, Antakly MC. Anaesthesia locoregionale pour cure microchirurgicale des hernies discales lombaires, *Journal Medical Libanais*. 2002;50:206-210
3. Jellish WS, Tahilji Z, Stevenson K. A prospective randomized study comparing short and intermediate term perioperative outcome variables after spinal or general anaesthesia for lumbar disk and laminectomy surgery. *Anaesthesia Analgesia* 1996; 83: 559-64
4. Rodriguez JP, Tambel A, Dua R, Pereda E, Calthorpe D. Spinal or general anaesthesia for lumbar spinal microdisectomy surgery does it matter? *The internet journal of Spine Surgery* 2007;2
5. Hudgins RW. The role of microdisectomy. *Orthop Clin North Am* 1983; 14:589-603
6. Mahan KT, Wang J. Spinal morphine anaesthesia and urinary retention. *J Am Podiatr Med Assoc* 1993; 83:607-14
7. Apley G, Solomon L. The back. In: Apley G, Solomon L (eds). *Apley's system of orthopaedics & fracture*. 7th edn. Oxford: Butterworth Heineman Ltd., 1993: 348-382.
8. William KD, Park AL. The back. In: Canale ST (ed). *Campbell's operative orthopaedics*. 10th edn. Philadelphia Pennsylvania: Mosby, 1998: 1955-2028