



JOURNAL CLUB PRESENTATION

Presented by

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LOW BACK PAIN



- Low back pain (lumbago) is a very common problem in health services all around the world. Almost every one over forty years of age have some episode of low back pain. Various conditions are responsible for this. In developing countries like Bangladesh, the underlying causes of back pain is usually less diagnosed and not properly treated.

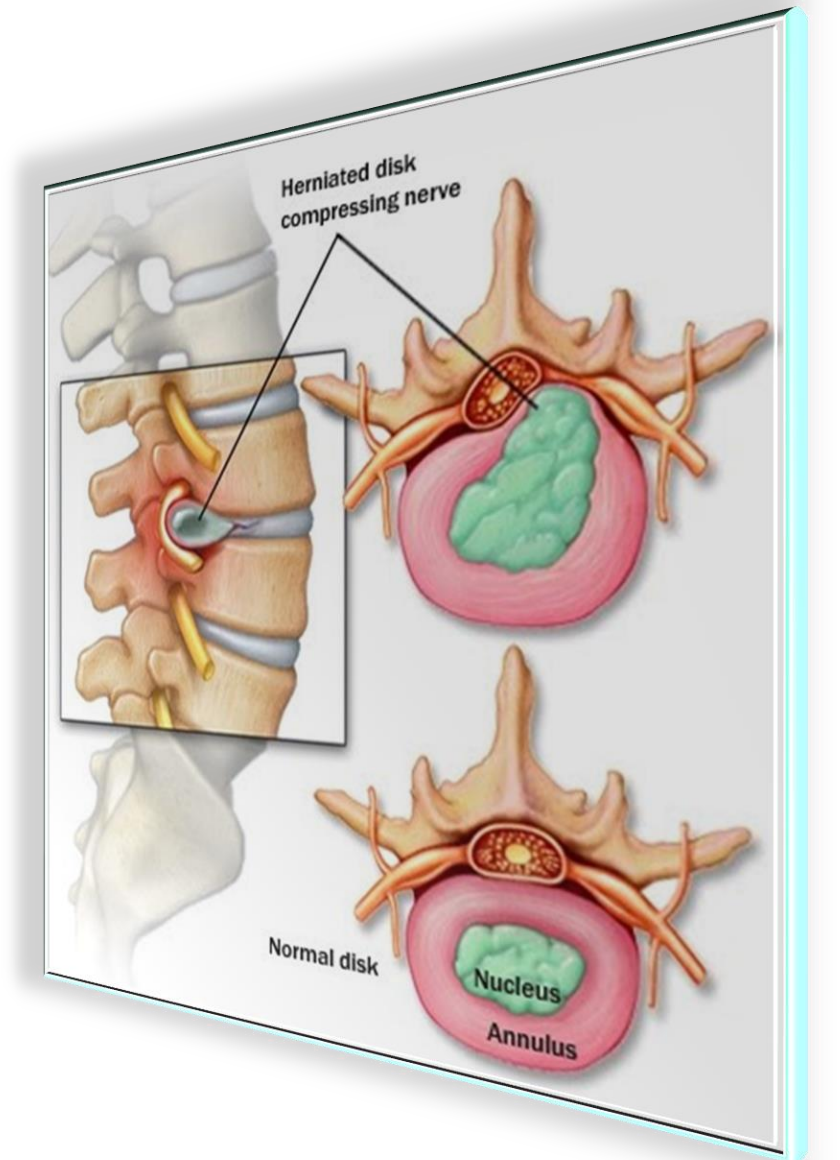
PLID

(PROLAPSED LUMBAR INTERVERTEBRAL DISC)

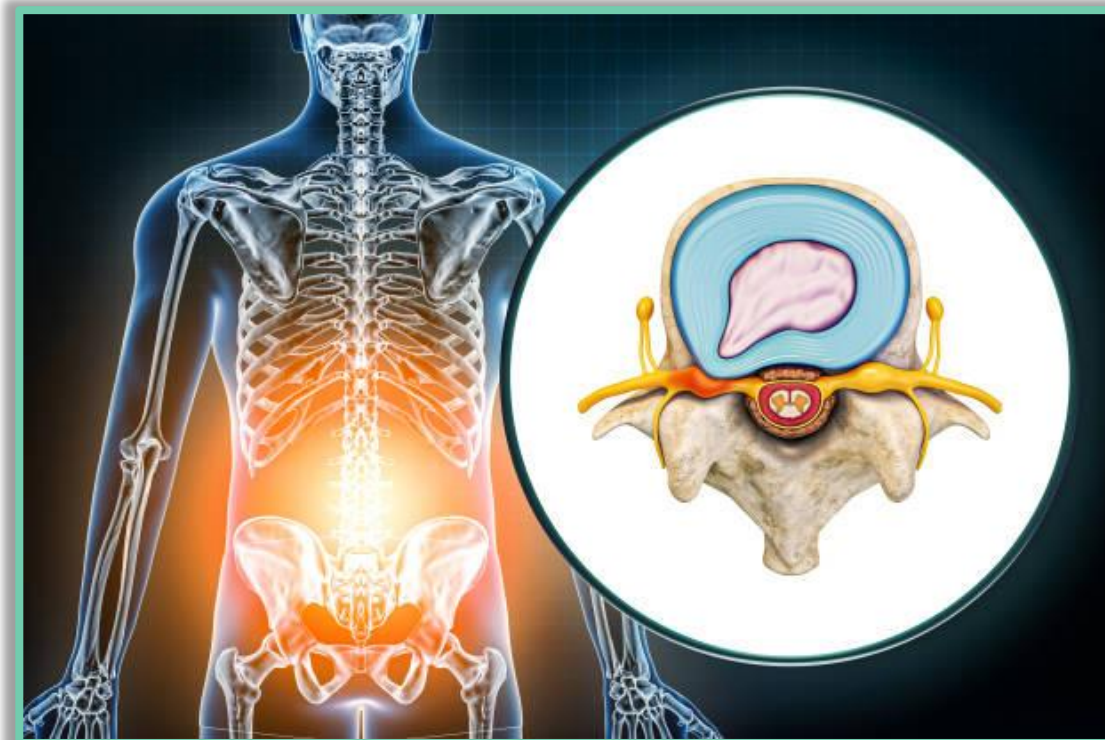


- Prolapsed lumbar intervertebral disc (PLID) is an important cause of low back pain and it is one of the frequent causes of disability. When conservative management fails, surgery is the only way to treat these patients and different surgical procedures are there.

- A disc herniation occurs when the jell-like center of the intervertebral disc (nucleus pulposus) tears its way through the back-outer portion of the disc (annulus fibrosus) and invades the space (anterior epidural space in spinal canal) where the delicate nerve structures live.



- And the presences of this nuclear material (which is filled with biochemical irritants called cytokines) in the anterior epidural space may severely irritate these neural structures, which in turn may cause severe back and/or leg pain. (Ohtori et al 1999, 2001).



CLASSIFICATION

The three main classifications of disc herniation are:

1. **Protrusion** (contained herniation or sub-ligamentous herniation).
2. **Extrusion** (noncontained herniation, or trans-ligamentous herniation) and
3. **Sequestration** (free fragment).



Disc Protrusion



Disc Extrusion



Disc Sequestration

AETIOPATHOGENESIS

- In 80% of cases the protrusion is traumatic in origin and there is either a history of sudden severe strain due to heavy weight lifting or patient's occupation is one in which flexion strain must be resisted, such as packer, fireman, porter, etc.
- In 20% of cases the condition is degenerative in origin. There is also a history of minor trauma. The precipitating factor, therefore, is mainly injury immediately or shortly before the onset of a symptom.

- Since the mechanism demands the combination of stress and mobility, the disc herniations commonly occur at a site where a relatively rigid segment of the spine join a flexible segment, which are subjected to greater stress and mobility. Hence, in the lumbar region, the **L4-L5 and L5-S1 discs are most often affected.**

INDICATIONS FOR SURGERY

1. Cauda equina syndrome,
2. Progressive neurologic deficit,
3. Profound neurologic deficit, and
4. Severe and disabling pain refractory to four to six weeks of conservative treatment.

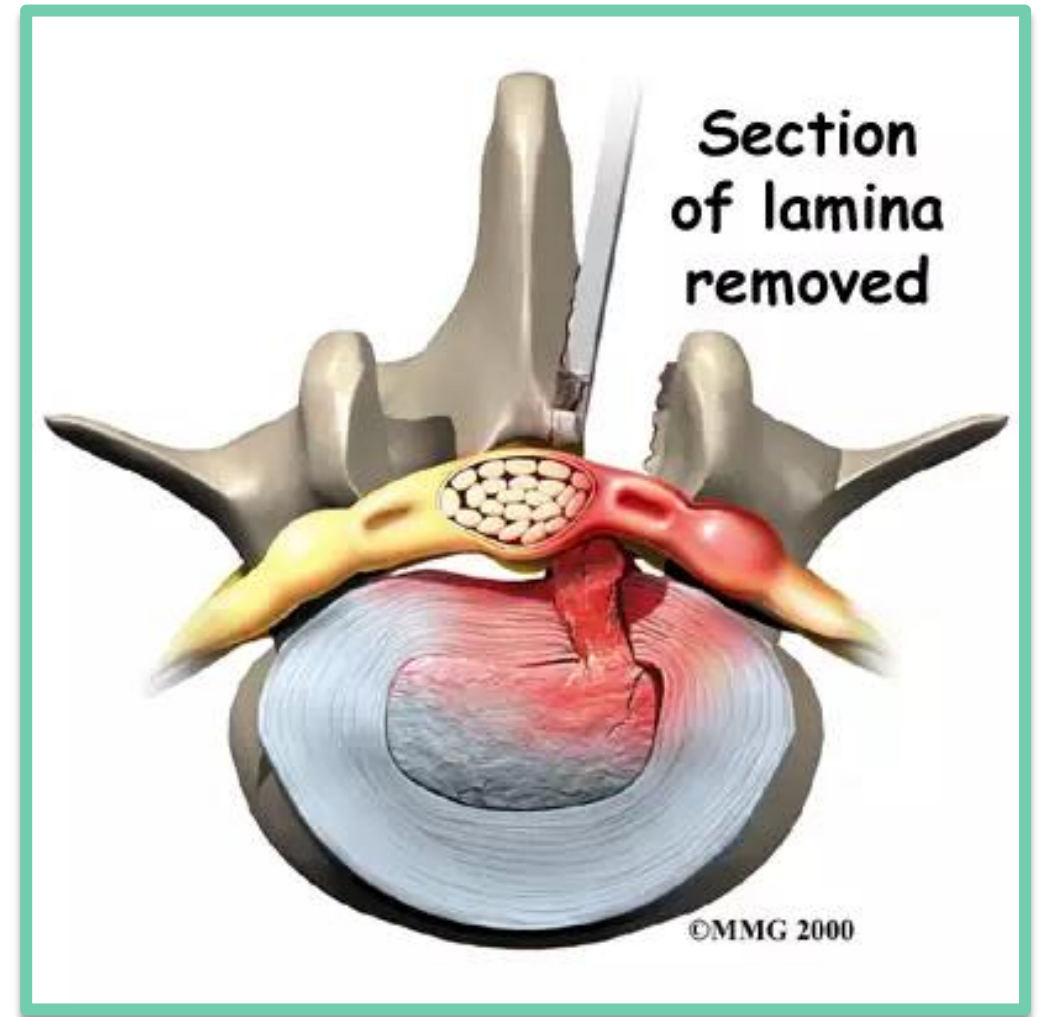
SURGICAL TECHNIQUES

1. Fenestration and discectomy,
2. Laminotomy and discectomy,
3. Microdiscectomy,
4. Endoscopic discectomy,
5. Percutaneous discectomy,
6. Laser discectomy etc.
7. However, **open discectomy is still considered as the gold standard** by the spine community for the surgical treatment of prolapsed discs that are causing severe weakness or pain and if the disc is extruded or sequestered.

GOLD STANDARD OF PLID SURGERY (LAMINOTOMY AND DISCECTOMY)

- The term laminotomy is derived from the latin word “lamina” (bony plate that covers the posterior arch of the vertebra) and “otomy” (act of cutting).
- The laminotomy is an open procedure. By definition it is a surgical procedure that is used to relieve pressure off the spinal canal for the exiting nerve root and spinal cord, increasing the amount of space available for the neural tissue and thus releasing the nerve.

- In laminotomy **only a part of the lamina is cut and extracted.** This is beneficial because the natural support of the lamina is left in place and post operative stability is maintained. At the same time the removal of part of lamina creates more space for the spinal cord and nerves, successfully decompressing.



COMPLICATION OF SURGERY

(a) Per-operative

- Root injury.
- Dural tear.

(b) Post-operative:

- Discitis.

TITLE OF THE PAPER

**OUTCOME OF SURGICAL MANAGEMENT
IN LUMBER DISC PROLAPSE: A STUDY IN
DHAKA MEDICAL COLLEGE HOSPITAL,
DHAKA, BANGLADESH**

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Research Article

Outcome of Surgical Management in Lumbar Disc Prolapse: A Study in Dhaka Medical College Hospital, Dhaka, Bangladesh

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Abstract

A disc herniation is the term given to any uneven out-pouching or bulging of the posterior region (back region) of the intervertebral disc as seen on MRI. The bigger the lumbar/sacral disc herniation, the more likely it is to cause back and/or leg pain--the latter of which is called sciatica. The aim of this study was to evaluate the surgical outcome in the treatment of Lumbar Disc Prolapse (LDP). The prospective interventional study (Quasi experimental) was done in the Department of Orthopedics and Traumatology, Dhaka Medical College and Hospital during the period of June 2009 to July 2011(2 years). Due to time limitation and financial constraint only 35 cases were selected during study period but out of them 29 cases were feasible to be included in the study, remaining 6 cases were lost during follow up. Patients of both sexes aged between 18-70 years with prolapsed lumbar intervertebral disc admitted in the Department of Orthopedics and Traumatology were included as purposive sampling. Data was entered, coded, cleaned, and analyzed by using Statistical Package for Social Science (IBM SPSS), version 20. In our study we found, Clinically 17(58.6%) of patients had weakness in extensor hallucis longus (EHL) and 3(10.3%) of patients had weakness in flexor hallucis longus (FHL). 14(48.3%) of patients had sensory deficit over the distribution of L5 nerve root and 6(20.7%) had S1 nerve root. In X-ray there were 6 transitional vertebra and loss of lumbar lordosis was in 20 patients. MRI shows 20(62.5%) of patients had posterolateral disc bulge and 12(37.5) had posterior disc bulge. In majority of patients (65.5%) of patients had disc prolapse at level L4-L5. 53.7% of patients had left sided disc prolapse.

Peroperatively seen that 62.5% of the patients had posterolateral disc prolapse and 37.5% patients had central disc prolapse. There were only 10.3% of patients had complications. Among these 6.9% had per operative dural tear and 3.4% developed discitis. At the final follow up most of the patients were pain free. All patients had absence of muscle spasm. No patients had restriction of mobility. Most of the patients regaining their straight leg raising in between 60-90 degree. The overall result of surgery was encouraging. Relief of symptoms occurred in 28 (96.6%) of patients. Out of 35 patients 40% of patients returned to work within 3 weeks of operation and 46.6% patients returned to work within 6 weeks of operation but rest of the cases still did not return to their previous work due to pain.

Keywords: Outcome; Surgical Management; Lumbar Disc Prolapse

1. Introduction

A disc herniation is the term given to any uneven out-pouching or bulging of the posterior region (back region) of the intervertebral disc as seen on MRI. The bigger the lumbar/sacral disc herniation, the more likely it is to cause back and/or leg pain--the latter of which is called sciatica [1]. Though low back pain and sciatica had affected the human race since time immemorial, until the first quarter of previous century, little knowledge had been acquired about the ways in which the intervertebral disc might cause compression on intra-spinal neural structures. Disc prolapse occurs in the working age adult population as they are the ones most likely to be exposed to trauma due to mechanical stress and strain. The most

PURPOSE OF THE STUDY

- To assess the functional recovery & surgical outcome following laminotomy & discectomy regarding the pain relief, mobility & postoperative hospital stay.
- To determine the complications of laminotomy & discectomy.

METHODOLOGY

- **Study type:** Prospective Interventional study
- **Period & Place of study:** July 2009 to June 2011, DMCH & different clinics in Dhaka city.
- **Number of Patient:** 35, 29 feasible & 06 out of follow up
- **Mean age :** 38.9 ± 14.0
- **Gender:** 21(72.4%) Male & 8 (27.6%) Female

OBSERVATION

- *Clinically* ,
 - ❑ 17(58.6%) of patients had weakness in extensor hallucis longus (EHL) and 3(10.3%) of patients had weakness in flexor hallucis longus (FHL).
 - ❑ 14(48.3%) of patients had sensory deficit over the distribution of L5 nerve root and 6(20.7%) had S1 nerve root.
 - ❑ In X-ray there were 6 transitional vertebra and loss of lumbar lordosis was in 20 patients. MRI shows 20(62.5%) of patients had posterolateral disc bulge and 12(37.5) had posterior disc bulge.

- ❑ Majority of patients (65.5%) had disc prolapse at level L4-L5.
- ❑ 53.7% of patients had left sided disc prolapse.
- ❑ Peroperatively seen that 62.5% of the patients had posterolateral disc prolapse and 37.5% patients had central disc prolapse.

- ❑ Only 10.3% of patients had complications.
- ❑ Among this, 6.9% had per operative dural tear and 3.4% developed discitis.

□ Preoperative hospital stay, **maximum was 30 days and minimum was 5 days** (mean SD=14.3±6.9) but postoperative hospital stay, maximum was 19 days and minimum was 3 days (mean±SD=8.1±3.3).

□ Maximum number of patients were followed up between 6-12 months.

DIAGNOSTIC CRITERIA OF LUMBAR DISC PROLAPSE

1. History of dominant complaint of radicular rather than low back pain.
2. Positive straight leg raising sign.
3. Any changes in sensation, muscle power and reflexes in leg and foot.

INVESTIGATION

- ❑ Plain X-ray lumbo-sacral spine A/P and lateral view,
- ❑ Magnetic resonance imaging (MRI),
- ❑ Lumbar myelography (when MRI is not possible),
- ❑ CT Scan (in special condition).

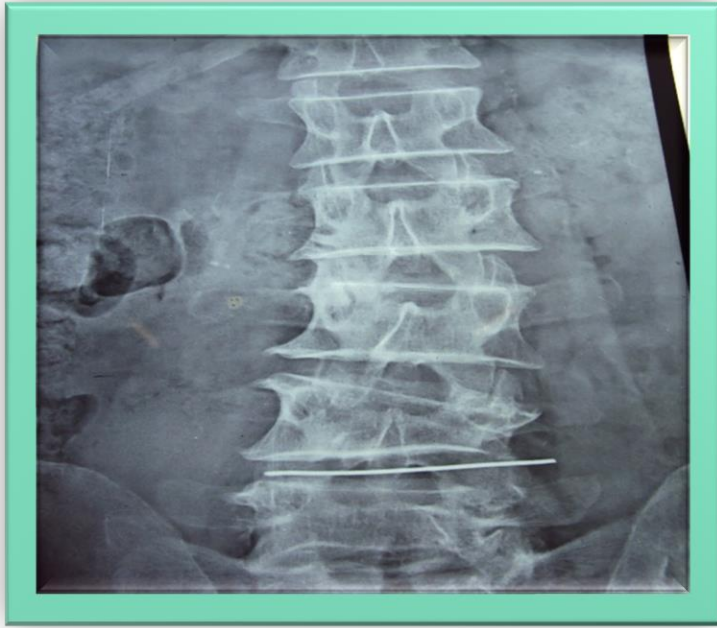


Photo 1:
Plain X-ray LS Spine
AP view with marking
at L4/5 level.

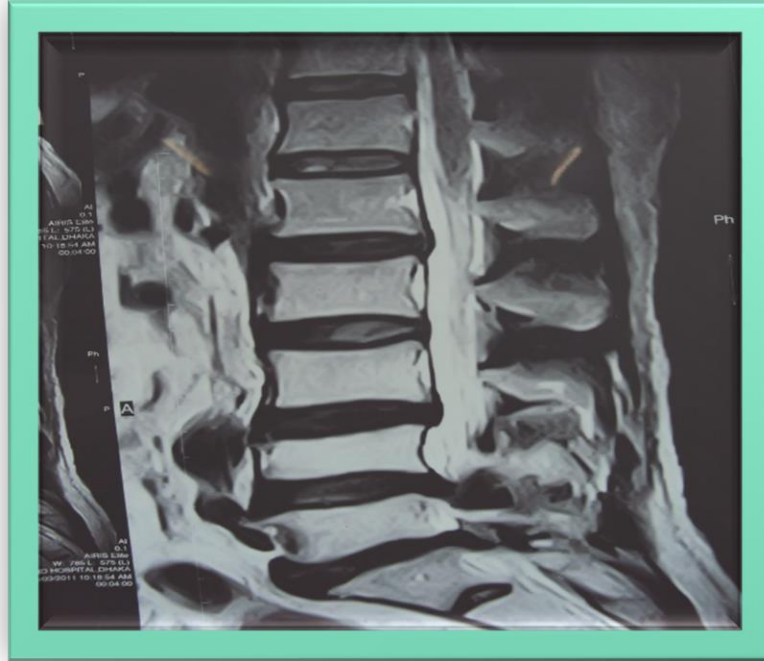


Photo 3:
MRI of LS Spine sagittal
section shows PLID at L4-
L5 and L5/S₁ level.

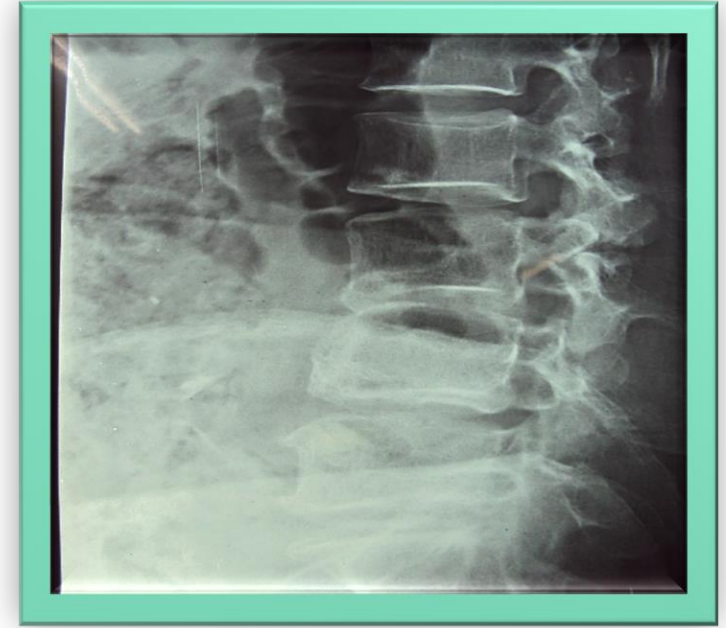


Photo 2:
Plain X-ray LS Spine
lateral view.

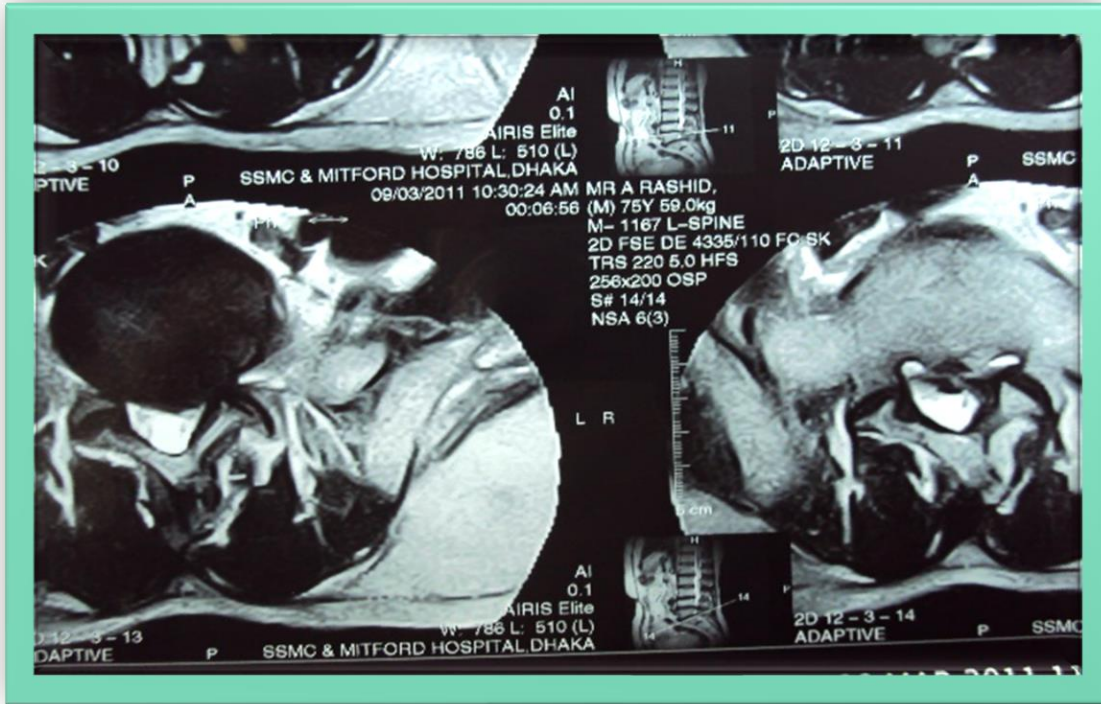


Photo 4 :
MRI of LS Spine transverse section shows central disc prolapse at L5/S₁ level and posterolateral disc prolapse at L4/5 level.



Photo 5 :
Showing operative view.



Photo 6:
Showing SLR after operation.



Photo 7:
**Showing post operative
lumbar flexion.**

EVALUATIONS OF RESULTS

□ The result of laminotomy and discectomy was evaluated by using Modified Macnab outcome criteria-

1. Excellent
2. Good
3. Fair
4. Poor

RESULT

The result of surgery was encouraging.

- Among the 29 patients, 28 patients had benefited from surgery & 1 had discitis.
- In the terms of functional outcome (According to modified Macnab criteria): 72.4% of patients had excellent, 17.2% good, 6.9% fair & 3.4% of patients had poor outcome

COMPARATIVE RESULT

Raff et al (1959) reported results of surgery of prolapsed lumbar disc: Excellent-43%, Good-37%, Fair-14%, Poor-6%. **Brown and Pont (1963)** showed the result with L5-S1 disc prolapse: Excellent-24%, Good-31%, Fair-33.4% and Poor-11.2%. With L4-L5 disc prolapse: Excellent 15.7%, Good-42%, Fair-27.8% and Poor-13.9%.

Spangfort (1972) in his series indicates the softer the disc found at the time of surgery, the lower the chance of a good result.

Shanon and Paul (1979) reported 86% on men and 79% women were free of all symptoms after operation for lumbar disc prolapse.

Nabi et al. (1982) reported uniform satisfactory results in 11(84.6%) cases out of total 13 cases.

Khan et al. (1991) shown in their series 88.43% cases were whether cured or beneficial after disc surgery.

| Author & Year | No. of patients | Results Excellent/good- | Followup in years |
|-------------------------------|-----------------|-------------------------|-------------------|
| Atlas et al. 2005 | 217 | 69 | 10 |
| Bakhsh et al. 2010 | 39 | 79 | 10 |
| Butterman et al. 2004 | 100 | 92 | 2.5 |
| Hsu et al. 2011 | 226 | 82 | 2 |
| Jansson 2004 | 22261 | 78 | 6 |
| Mariconda et al. 2006 | 201 | 90 | 27.8 |
| Martinez quinones et al. 2011 | 142 | 93 | 5 |

-Studies of Open laminectomy/laminotomy with discectomy

Functionality Status and Surgical Outcome of Fenestration versus Laminotomy Discectomy in Patients with Lumbar Disc Herniation

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Outcome of laminotomy and discectomy in lumbar intervertebral disc prolapse

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ORIGINAL ARTICLE: PDF ONLY

Outpatient Laminotomy and Discectomy

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PMCID: PMC4843341

PMID: [27134956](https://pubmed.ncbi.nlm.nih.gov/27134956/)

Functional Outcome of Lumbar Discectomy by Fenestration Technique in Lumbar Disc Prolapse – Return to Work and Relief of Pain

[Ujjwal Gowardhan Wankhade](#),^{✉1} [Mahesh Kotehal Umashankar](#),² and [B.S. Jayakrishna Reddy](#)³

Functional Outcome after Fenestration and Discectomy in Young Adults Presenting with Unilateral Radiculopathy

Adimoolam, Manikandan; Solomon, Prince¹; Murugan, Yuvaraja¹; Govindaswamy, Ramachandran²; Ganadoss, James Jawahar¹; Najimudeen, Syed¹

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Fenestration and Discectomy is Safe and Effective Procedure for the Treatment of Prolapse Lumbar Intervertebral Disc

January 2020

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Long-term Clinical Outcomes in Patients Undergoing Lumbar Discectomy by Fenestration

[J Shi](#), [Y Wang](#), [...], and [H Yang](#)  [View all authors and affiliations](#)

[All Articles](#) | <https://doi.org/10.1177/030006051204000634>

2018, Volume 4 Issue 1

Outcome analysis of fenestration discectomy for lumbar disc prolapse

Author(s): Dr. Mohan Kumar, Dr. Raju KP and Dr. Sudeep Shetty

SUMMARY

- ❑ In comparison to other studies the overall result of surgery was encouraging.
- ❑ Most of the patients are pain free & absent of muscle spasm.
- ❑ No patient had restriction of mobility. Most of the patients regained their straight leg raising between 60-90 degree.

LIMITATION

- ❑ Outcome of the study was very good but the number of cases in this study was small and duration is only 2 years.
- ❑ Of 29 cases, some patients could not come to follow-up in time.
The cost of the investigation & the study time were also constraints.

RECOMMENDATION

- ❑ This study was done on 29 patients; follow up period was 3, 6 and 12 months.
- ❑ So, further study with larger sample size, longer follow up period is required to delineate the outcome.

CONCLUSION

- It reveals that management of prolapsed lumbar intervertebral disc by laminotomy and discectomy is an effective method of treatment, & it reduces the complications & increase the chances of successful outcome.
- This study was done on 29 patients; follow up period was 6-12 months. Therefore, further study with larger sample size, longer follow up period is required to delineate the outcome.



THANKS