

# Result of Endoscopic Dissectomies for Treatment of Symptomatic Prolapse Lumbar Disc Herniation

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## ABSTRACT

**Introduction:** Lumbar disc prolapsed is a common problem and causes pain or weakness. There are multiple treatment options in which open surgical dissection is considered gold standard, but in this era trend is changed toward minimal invasive surgery i.e. endoscopic procedure. This study was carried out to determine the outcome of endoscopic dissection in our setup.

**Objective:** To determine the outcome of endoscopic dissection for the treatment of symptomatic lumbar disc herniation.

**Study Design:** Descriptive case study.

**Setting:** This study was carried out in Department of Neurosurgery Lahore General Hospital Lahore.

**Duration:** Six months from 20-4-11 to 21-10-11.

**Methods:** Thirty patients were included in this study. All patients were treated with endoscopic dissection. The outcome were determined at 3 months follow-up based on MacNab's classification system.

**Results:** According to MacNab's classification system 26 (88.6) patients had successful outcome including excellent and good outcome.

**Conclusion:** Endoscopic dissection is a safe and effective treatment for patients with lumbar disc herniation.

**Key Words:** Lumbar disc prolapse, Endoscopic dissection.

## INTRODUCTION

In 1934 Mixter and Barr described disc herniation. They defined it as posterior rupture of the intervertebral disc allowing nuclear material to leak and causes compression of the adjacent spinal nerve root.<sup>1</sup> Approximately 10% of patients complaining of backache suffered from lumbar disc herniation.<sup>2</sup> About 90 to 96% of all lumbar disc herniation occur at L<sub>4-5</sub> and L<sub>5</sub>–S<sub>1</sub> levels.<sup>2,3</sup>

To confirm the diagnosis of lumbar disc herniation patient history, physical examination and the result of radiological investigations like MRI are evaluated. Majority of the patients suffering from lumbar disc herniation respond well with conservative management.<sup>4,5</sup> Diagnostic testing from herniated lumbar disc

includes MRI, Myelography and CT Scan either alone or in combination as the occasion demands.<sup>6,7</sup> Among these MRI is the investigation of choice with accuracy ranging from 76 – 96%.<sup>7</sup>

At the initial stage, conservative mode of treatment if adopted for most of the patients who present with complaints of backache and leg pain. However for the patients with failure of conservative management surgical treatment is offered. Surgical treatment can be in the form of open or endoscopic dissection.<sup>8,9</sup>

Although good outcomes have been reported in the past with open dissections, this procedure is not free of complications such as intra-operative nerve root injury, post-operative peri-neural scarring, fibrosis,

prolonged hospital stay and pain.<sup>5</sup>

Endoscopic dissection is a relatively newer technique which allows direct visualization and easy removal of the disc. The advantages of endoscopic dissection over open technique is that it involves a posterior approach without muscle cutting that causes less damage to the muscular and ligamentous structures which facilitates faster rehabilitation, shorter hospital stay and earlier return to activity.<sup>8,10,11</sup>

In a clinical trial by Jhala A. et al, endoscopic dissection for L<sub>4</sub> and L<sub>5</sub> disc herniation was performed in 100 patients and outcome was noted three months post-operatively according to MacNab's criteria and it was found that percentage of successful outcome (good / excellent) was 91%.<sup>12</sup> The trend of treating lumbar disc herniation with endoscopic dissections is becoming popular throughout the world. Studies have shown that this is a safe procedure with successful outcome.

**MacNab's Classification**

**Table 1:** Modified Macnab criteria to assess clinical outcome.

<b>Excellent</b>	Free of pain No restriction of mobility Able to return to normal work and activities
<b>Good</b>	Occasional non-radicular pain Relief of presenting symptoms Able to return to modified work
<b>Fair</b>	Some improved functional capacity Still handicapped and / or unemployed
<b>Poor</b>	Continued objective symptoms of root involvement, Additional operative intervention needed at the index level, irrespective of repeat or length of post operative follow up

**MATERIAL AND METHODS**

This study was carried out in Department of Neurosurgery, Lahore General Hospital, Lahore from 20-04-2011 to 21-10-2011. A total of 30 patients were selected for the study. All patients were admitted through outdoor. After informed consent, demographic information including age, sex and address was noted. After getting medical and anesthesia fitness for surgery these patients were subjected to endoscopic dissection by consultant neurosurgeon. Patients were

discharged when found free of pain and able to walk without support. These patients were examined in outdoor three days after surgery for wound check-up and assessment of clinical condition. The monthly follow-up was done for three months on the basis of MacNab's classification according to which all patients were divided into four groups (excellent, good, fair and poor). The patients having excellent and good results were labeled as having successful outcome. All the information was collected on a specially designed Proforma.

**Inclusion Criteria**

1. Both male and female patients between 20 – 55 years.
2. Symptomatic unilateral lumbar disc herniation.

**Exclusion Criteria**

1. Patients with previous history of spinal surgery.
2. Patients with previous history of spinal trauma.
3. Patients with complaints of pain radiating to both legs.

**RESULTS**

There were total 30 patients included in this study.

**Age Incidence**

There were five patients with age ranging from 20 – 30 years (17.1%), eight patients from 31 – 40 years (28.6%), nine patients from 41 – 50 years (31.4%) and eight patients from 51 – 55 years (22.9%). Mean age of the patients was 40.06 ± 10.39 years range: 20 – 55 (Table 2).

**Table 2:** Distribution of Patients by Age (n = 30)

Age in Years	No. of Patients	Percentage
20 – 30	5	17.1
31 – 40	8	28.6
41 – 50	9	31.4
51 – 55	8	22.9
Mean ± S.D.	40.06 ± 10.39	
Range	20 – 70	
Total	30	100

**Sex Incidence**

There were twenty four male patients (82.9%) and six were females (17.1%). The male to female ratio was 1:1.28 (Fig. 1).

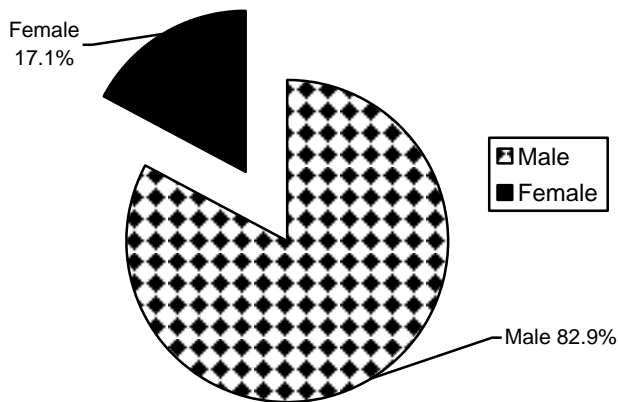


Fig. 1: Sex Incidence.

Table 3: Distribution of Patients by Results Based on MacNab's Classification.

Results	No. of Patients	Percentage
Excellent	11	37.4
Good	16	51.4
Fair	2	8.6
Poor	1	2.9
Total	30	100

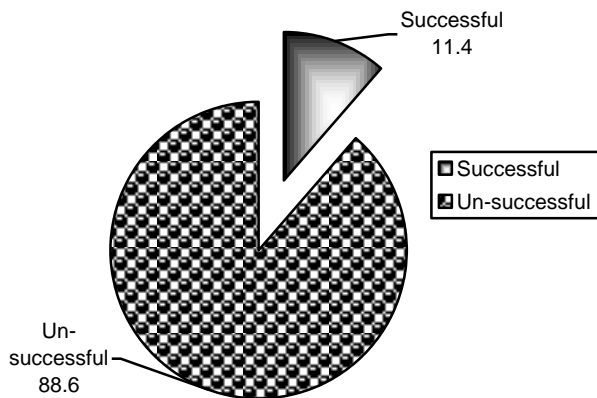


Fig. 2: Incidence of Patients by Successful Outcome

**Results of Surgery according to MacNab's Classification**

The results of surgery were Excellent among 11 (37.4%), Good among 16 (51.4%), Fair among 2 (8.6%) and Poor among 1 (2.9%) patients (Table 3).

**Incidence of Patients by Successful Outcome**

Based on results of MacNab's Classification the outcome was Successful among 27 (88.6%) and was un-successful among 3 (11.4%) patients (Fig. 2).

**Incidence of Complications**

Superficial wound infection was seen among 2 (5.7%), Discitis among 2 (5.7%), and Dural tear among 3 (8.6%) (Table 4).

Table 4: Distribution of Patients by Complications (n = 30).

Complications	No. of Patients	Percentage
Wound infection	2	5.7
Discitis	2	5.7
Dural tear	3	8.6
Total	7	20

**DISCUSSION**

Although, open surgical discectomies are taken as gold standard, endoscopic lumbar discectomy for adolescent lumbar disc herniation are gaining attention worldwide because of its less complication rate, avoidance of problems of wound infection and off course, high success rate.

This study was conducted among 30 patients with lumbar disc herniation who received treatment with endoscopic discectomy and the results of the study were in favor of the technique with a high frequency of successful outcome i.e. 88.6%.

Some other authors have also described the outcome of endoscopic discectomies in their centers.

A study was conducted by JU, et al<sup>13</sup> in which the outcome of lumbar discectomy were studied among 26 patients with lumbar disc herniation. This study dominated the female population, while in our study, male were dominated, male to female ratio was 1:1.28. They also included the patients of all age groups, i.e. from 20 to 70 years. Like our study, they adopted the MacNab's criteria as outcome parameter. Mean

follow-up was 6.37 months. In their study, 23.1% patients showed excellent results, 65.4% cases showed good outcome, fair result in 5.5% patients, and poor result in 3.8% patients. Thus successful outcome in their study were seen among 88.5% cases. The results of this study were also comparable to our study as successful outcome were seen among 88.6% patients with maximum cases achieved good outcome i.e. in 51.4% followed by excellent outcome in 37.1%.

Lee DY, et al,<sup>14</sup> conducted a study to analyze the surgical outcome in 46 consecutive adolescent patients between 13 years and 18 years of age (mean age: 16.5 years) with single level lumbar disk herniation. The mean follow-up duration was 37.2 months. They analyzed the outcome of patients in VAS and MacNab's criteria. In terms of MacNab's criteria 91.3% of the patients showed excellent or good outcomes. This was also comparable to our results i.e. 88.6%.

In a study by Peng, et al,<sup>11</sup> 100 consecutive patients with lumbar disc herniation of age range 19 – 65 years were operated for endoscopic dissection. The mean age was 35.6 years. North American Spine Score (NASS) and VAS were applied which showed a significant reduction in the severity of back pain and lower limb symptoms at 6 months and 2 years.

Jhala, et al,<sup>12</sup> conducted a study on 100 consecutive patients of age range of 19 – 65 years with lumbar disc herniation for endoscopic dissection. Patients were evaluated by modified MacNab's criteria. Patients were followed up at 2.6, and 12 weeks. Overall 91% of patients had good – to – excellent results, with four patients having recurrence of whom three were re-operated. The results of this study were also encouraging and validated the results of our study which showed the frequency of successful outcome.

Perez – Cruet, et al,<sup>15</sup> described the outcome of endoscopic lumbar dissections among 150 patients with lumbar disc herniation. They found that excellent results were seen among 77% patients and good results were seen among 17% patients, with overall success of the procedure as 94%.

In our study, MacNab's score was used to measure the outcome parameter; MacNab's criteria have also been used by JU, et al,<sup>13</sup> and Lee DY.<sup>14</sup> Various other parameters have been adopted by other authors. Peng CWB.<sup>11</sup> Used North America Spine Score (NASS). Medical Outcomes Study Short Form – 36 score (SF – 36) and Pain Visual Analogue Scale (VAS) and return to work. VAS has also been used by Ju; et al,<sup>13</sup> Jhala, et al,<sup>12</sup> used MRI to see complete decompression. All of these outcome parameters are reliable. We preferred

MacNab's criteria as it is simple to apply and can be completed on follow-up of the patient in outpatient department without need of any investigations. So it may be cost effective in our developing country with limited resources, where majority of patients belong to poor socioeconomic status.

The overall failure rate was seen among 3 (11.4%) patients. Of these 3 patients with failure, Discitis was seen among 2 (8.6%) patients and the one (2.9%) patient had recurrence which was seen at the level L<sub>4-5</sub> which happened after two months. Study by Jhala, et al,<sup>17</sup> has reported as much less rate of Discitis i.e. 4% and even was less in study by Peng CWB, et al,<sup>11</sup> i.e. 1.8%.

We managed all the cases of Discitis conservatively. However, we offered MRI among all of the patients with Discitis in order to rule out any compression of thecal sac by residual of recurrent disc. Jhala et al,<sup>11</sup> also managed most of the cases of Discitis conservatively; however, one patient had second procedure i.e. fusion for relief of pain.

Dural tear was observed among 3 (11.4%) patients in our study. When compared to the rate of the complication in study by Perez Cruet MJ, et al<sup>15</sup> it was 5%. All the patients with dural tears in our study healed spontaneously after water light closure of the wound.

Superficial wound infections were seen among 2 (5.7%) patients who were treated with antibiotics.

No nerve root injury was noticed in our study, while study by Jhala, et al,<sup>18</sup> showed that 1 (1%) patient had root damage to L<sub>5</sub> root that had paresthesia in L<sub>5</sub> region even on 4 year of follow-up.

The complication which we had are due to initial learning curve, MED has a definite learning curve because of two – dimensional visions, orientation with scope, handling of the scope, less space available for dissection, and managing epidural bleeding.

One of the patients in our study had sciatica with intermittent priapism along with intermittent claudication. The priapism subsided after successful L<sub>4-5</sub> dissection. Another patient in the study had foot drop which showed improvement at one month follow-up. It was also observed that sacral sensations were mooted to restore immediately after the successful dissection.

This study has some limitations. This was not a blinded study.

## CONCLUSION

The frequency of successful outcome with percutaneous endoscopic lumbar dissection is high. It is a safe and efficacious technique to relieve symptoms of herniated discs prolapsed. This is recommended that this technique should be attempted among every patient with lumbar disc herniation in our setup.

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