Result of Endoscopic Dissectomies for Treatment of Symptomatic Prolapse Lumber Disc Herniation

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ABSTRACT

Introduction: Lumber disc prolapsed is a common problem and causes pain or weakness. There are multiple treatment options in which open surgical dissectomy 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 dissectomy in our setup.

Objective: To determine the outcome of endoscopic dissectomy for the treatment of symptomatic lumber 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 dissectomy. 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 dissectomy is a safe and effective treatment for patients with lumber disc herniation.

Key Words: Lumber disc prolase, Endoscopic dissectomy.

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. Approximately 10% of patients complaining of backache suffered from lumber disc herniation. About 90 to 96% of all lumber disc herniation occur at L₄–₅ and L₅–S₁ levels.

To confirm the diagnosis of lumber disc herniation patient history, physical examination and the result of radiological investigations like MRI are evaluated. Majority of the patients suffering from lumber disc herniation respond well with conservative management. Diagnostic testing from herniated lumber disc includes MRI, Myelography and CT Scan either alone or in combination as the occasion demands. Among these MRI is the investigation of choice with accuracy ranging from 76 – 96%.

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 dissectomy.

Although good outcomes have been reported in the past with open dissectomies, this procedure is not free of complications such as intra-operative nerve root injury, post-operative peri-neural scaring, fibrosis,
prolonged hospital stay and pain.\textsuperscript{5}

Endoscopic discectomy is a relatively newer technique which allows direct visualization and easy removal of the disc. The advantages of endoscopic discectomy 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.\textsuperscript{8,10,11}

In a clinical trial by Jhala A. et al, endoscopic discectomy for L\textsubscript{4} and L\textsubscript{5} 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\%.\textsuperscript{12} The trend of treating lumbar disc herniation with endoscopic dissecotomies 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.

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

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 \(40.06 \pm 10.39\) years range: 20 – 55 (Table 2).

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 – 30</td>
<td>5</td>
<td>17.1</td>
</tr>
<tr>
<td>31 – 40</td>
<td>8</td>
<td>28.6</td>
</tr>
<tr>
<td>41 – 50</td>
<td>9</td>
<td>31.4</td>
</tr>
<tr>
<td>51 – 55</td>
<td>8</td>
<td>22.9</td>
</tr>
<tr>
<td>Mean ± S.D.</td>
<td>40.06 ± 10.39</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range</th>
<th>20 – 70</th>
</tr>
</thead>
</table>

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).

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 unsuccessful 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).

DISCUSSION
Although, open surgical discectomies are taken as gold standard, endoscopic lumbar dissectomy 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 in which the outcome of lumbar dissectomy 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,\textsuperscript{14} 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,\textsuperscript{11} 100 consecutive patients with lumbar disc herniation of age range 19 – 65 years were operated for endoscopic discectomy. 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,\textsuperscript{12} conducted a study on 100 consecutive patients of age range of 19 – 65 years with lumbar disc herniation for endoscopic discectomy. 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,\textsuperscript{15} described the outcome of endoscopic lumbar discectomies 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,\textsuperscript{13} and Lee DY.\textsuperscript{14} Various other parameters have been adopted by other authors. Peng CWB.\textsuperscript{11} 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,\textsuperscript{13} Jhala, et al,\textsuperscript{12} 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 L4,5 which happened after two months. Study by Jhala, et al,\textsuperscript{17} has reported as much less rate of Discitis i.e. 4% and even was less in study by Peng CWB, et al,\textsuperscript{11} 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,\textsuperscript{11} 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\textsuperscript{15} 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,\textsuperscript{18} showed that 1 (1%) patient had root damage to L5 root that had paresthesia in L5 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 L4,5 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 every patient with lumbar disc herniation in our setup.

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REFERENCES