

Endoscopic Microdiscectomy Versus Conventional Discectomy for Lumbar Disc Diseases; A Randomized Controlled Trial at Tertiary Care Hospital

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ABSTRACT

Objective: The aim of this study is to determine the efficacy of endoscopic microdiscectomy versus conventional discectomy for lumbar disc disease.

Study Design: Randomized Control trial

Place and Duration: Dow International Medical College and Hospital OJHA Campus, Karachi during the period from December, 2021 to May, 2022.

Methods: Total 70 patients of both genders were presented in this study. Patients detailed demographics age, sex and BMI were recorded after taking written consent. Patients were aged between 18-70 years, Patients were divided in to two groups I and II. Group I had 35 patients and underwent for endoscopic microdiscectomy and group II received conventional discectomy among 35 patients. The research included patients with low back pain radiating to the legs and prolapsed intervertebral discs at the L5-S1 and L4-L5 levels on MRI. Post-operatively effectiveness was observed between both groups, by using Oswestry disability index (ODI) in follow up of 10 months. Complete data was analyzed by SPSS.

Results: Total 34 (48.6%) patients were females and 36 (51.4%) were males. Mean age of the patients were 48.32± 6.44 years with mean BMI 26.14± 3.23 kg/m². Significantly no difference was observed between age and BMI. Patients who had prolapsed disc at L4-5 levels were 26 (37.14%) and 44 (62.86%) patients had prolapsed disc at L5-S1. Mean post-operative ODI in group I was 21.14± 5.4 and in group II was 24.16± 3.31. Mean post-operative vas in group I was 3.5 and in group II was 5.7. In group I hospital stay, blood loss and complications were observed less as compared to group II.

Conclusion: We concluded in this that both endoscopic microdiscectomy and conventional discectomy was effective and safe procedures. But conventional discectomy was found less effective as compared to endoscopic microdiscectomy in terms of rapid mobilization and postoperative pain.

Keywords: Oswestry Disability Index (ODI), Lumbar Disc Prolapse, Endoscopic Discectomy, Visual Analog Score (VAS)

INTRODUCTION

For the treatment of lumbar disc herniations, microdiscectomy (MD) is considered the gold standard surgical option. However, there is also concern about muscle injury, such as the multifidus, and exaggerated resection of the articular facet during laminectomy, which may result in instability, severe epidural fibrosis, and the persistence of radiated pain, as well as the risk of surgical site infection. As a less invasive option, endoscopic discectomy (ED) has been suggested. [1-5]

If the symptoms aren't severe, early conservative care is currently used. When conservative care fails or symptoms intensify over time, surgery is used [5,6]. The first surgical treatment for lumbar disk herniation was an open laminectomy and discectomy performed in 1934 [7]. The open lumbar discectomy was refined into open microdiscectomy (MD) with the invention of the microscope [8]. The most popular surgical procedure for decompression of radiculopathy caused by lumbar disk herniation is currently open microdiscectomy [9].

There were no substantial variations in pain and function after surgery in a few prospective randomized clinical trials comparing conventional MD with ED. [3,4] ED, on the other hand, resulted in shorter hospital stays, fewer bleeding, lower inflammatory serum markers,[5]and lower pain and complication rates. Many neurosurgeons agree that open laminectomy provides greater visibility and orientation of anatomy, and that it is the most widely practiced and approved procedure with the fewest risks of nerve root injury, facet joint damage, and instability.

Endoscopic discectomy has become more popular in recent years because it is less invasive, causes less muscle damage, and has a quick recovery time.[10] The indications for it are now growing due to advances in endoscopic tools and a greater understanding of technique.

MATERIAL AND METHODS

This randomized control trial was conducted at Dow International Medical College and Hospital OJHA Campus, Karachi during the period from December, 2021 to May, 2022 and comprised of 70 patients. Patients detailed demographics were recorded after taking written consent. Patients who had chronic disease, upper lumbar disc, traumatic disc prolapses and those did not give written consent were excluded from this study.

Patients were aged between 18-70 years, Patients were divided in to two groups I and II. Group I had 35 patients and underwent for endoscopic microdiscectomy and group II received conventional discectomy among 35 patients. Patients had low backache with radiation towards legs and prolapsed intervertebral disc at L5-S1 and L4-L5 levels on MRI were included in the study. Post-operatively effectiveness was observed between both groups, by using Oswestry disability index (ODI) in follow up of 10 months. T-test was used to observed ODI difference among both groups. Complete data was analyzed by SPSS.

RESULTS

Total 34 (48.6%) patients were females (17 in each group) and 36 (51.4%) were males (18 in each group). Mean age of the patients in group I was 47.88± 5.42 years with mean BMI 26.14± 2.66 kg/m² while in group II mean age was 48.16± 6.43 years with mean BMI 26.18± 3.32 kg/m². Significantly no difference was observed between age and BMI. (table 1)

Table 1: Baseline detailed demographics of enrolled cases

Variables	Group I (n=35)	Group II (n=35)
Sex		
Male	18	18
Female	17	17
Mean age	47.88± 5.42	48.16± 6.43
Mean BMI	26.14± 2.66	26.18± 3.32

Patients who had prolapsed disc at L4-5 levels were 26 (37.14%) and 44 (62.86%) patients had prolapsed disc at L5-S1. (table 2)

Table 2: Levels of prolapsed disc among both groups

Variables	Group I	Group II
Levels of disc		
L1-2	0	0
L2-3	0	0
L3-4	0	0
L4-5	14 (20%)	12 (17.14%)
L5-S1	21 (30%)	23 (32.86%)
Total	35	35

Mean post-operative ODI in group I was 21.14± 54 and in group II was 24.16± 3.31. Mean post-operative vas in group I was 3.5 and in group II was 5.7. In group I hospital stay, blood loss and complications were observed less as compared to group II. (table 3)

Table 3: Comparison of outcomes among both groups

Variables	Endoscopic microdiscectomy	Conventional discectomy
Mean vas		
Pre-operative	8.2	8.3
Post-operative	3.5	5.7
Mean ODI		
Pre-operative	62.15± 3.66	66.15± 6.59
Post-operative	21.14± 54	24.16± 3.31

DISCUSSION

Chronic lumbosacral pain is a common and challenging clinical condition that is at the heart of pain control. Back pain or intractable and extreme functional disability that has not responded to conservative measures is the most common surgical indication. We compared the outcomes of endoscopic microdiscectomy and traditional discectomy in this report. In present study 70 patients of both genders were presented in which total 34 (48.6%) patients were females and 36 (51.4%) were males. Mean age of the patients were 48.32± 6.44 years with mean BMI 26.14± 3.23 kg/m². Significantly no difference was observed between age and BMI. These findings were comparable to the previous studies.[11,12]

Lowerback pain is a common cause of morbidity among clinicians and workers, and it is also the leading cause of illness-related absence, which has financial implications. [13,14] Many types of patient care are available, but the results are usually unimpressive. The position and form of disc herniation, as well as its predictive value in the treatment of sciatica, are inconsistently reported in the literature. [15] This research also found that endoscopic spine procedures are less invasive, with fewer complications and a better outcome. [16] When opposed to traditional discectomy, we also found that our endoscopic surgery groups had less postoperative surgery site discomfort because there was less damage to the muscle, soft tissue, and bones, as well as less manipulation of nerve roots. In our research, the incision size of endoscopic discectomy was smaller than that of traditional discectomy, and microscopic discectomy also necessitated more muscle retraction and bony work.

Since it is a minimally invasive procedure that does not cause damage to the paravertebral muscle, patients treated with endoscopic discectomy have a stronger ODI outcome. Mean post-operative ODI in group I (endoscopic microdiscectomy) was 21.14± 54 and in group II (conventional discectomy) was 24.16± 3.31. Mean post-operative vas in group I was 3.5 and in group II was 5.7. In group I hospital stay, blood loss and complications were observed less as compared to group II. In another study, they performed a large-incision microdiscectomy with the use of a retractor and more bony work, as well as partial removal of the ligamentum flavum. [1] In our research, we found that endoscopic

and microscopic discectomy patients experienced strong postoperative radicular pain relief with no recurrence of symptoms.

The absence of muscle retraction in the ED, as well as the marginal lesion of healthy tissues, all contribute to reduced postoperative lumbar pain. CD necessitates retraction of the paravertebral muscles, bone resection of part of the lamina and the medial edge of the facet joint, and partial removal of the ligamentum flavum, in addition to a wider incision. Reduced hospital stays and early patient recovery are both aided by a decrease in postoperative pain. In the emergency department, the manipulation of nerve systems is also minimized. [1] In the case of extensive epidural fibrosis, there is a 3.2 times greater risk of symptoms persisting,[17] which is linked to the persistence of sciatic discomfort and unsatisfactory surgical results and should be avoided. [17, 18]

The average surgery time for endoscopic microdiscectomy in our sample was 120 minutes, which can be compared to other similar studies. The absence of epidural fibrosis and immobilization of the nerve roots, which are normal after open surgery, results in shorter hospital stays. [20] During endoscopic technique, the epidural vein system remains unchanged. This aids in the prevention of venous stasis and chronic nerve root swelling. Rapid healing can be aided by minimizing surgical damage to myo-ligament structures. Furthermore, traumatic nerve excision does not need any additional bone removal or broad skin incisions. [21] a The risk of scars, blood loss, infection, and anesthesia complications is greatly decreased or removed. All of this leads to less discomfort in the postoperative phase in endoscopically treated patients, reducing the need for postoperative analgesia and, as a result, potential radial pain, despite root pain relief in the operated patients. Since the paravertebral muscles are not shortened, they shrink and are badly weakened as a result. [22]

On longer follow-up, endoscopic and microscopic discectomies are similarly secure and reliable procedures for lumbar disc removal. However, because of early mobilization and less postoperative discomfort, endoscopic discectomy was found to be superior to traditional discectomy in terms of short-term outcomes.

CONCLUSION

We concluded in this that both endoscopic microdiscectomy and conventional discectomy was effective and safe procedures. But conventional discectomy was found less effective as compared to endoscopic microdiscectomy in terms of rapid mobilization and postoperative pain.

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