Original Article

Outcomes of Microdiscectomy Versus Conventional Discectomy

Microdiscectomy VS Conventional Discectomy

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ABSTRACT

Objective: Comparison of post-operative infection rate and back and leg pain on visual analogue scale in microdiscectomy versus conventional open discectomy.

Study Design: Experimental study

Place and Duration of Study: This study was conducted at the Neurosurgery ward Bahawal Victoria Hospital Bahawalpur from January 2023 to June 2023.

Materials and Methods: This study has been conducted with the collaboration of orthopedic surgeons and neurosurgeons. 60 study cases with symptomatic herniated lumbar disc were equally divided into two groups (30 cases in each group). One group underwent microdiscectomy while other group underwent open conventional discectomy. Outcomes in terms of post-operative infection rate and relieve in back and leg pain on visual analogue pain scale were compared of both groups. Adult patients of either gender were included in this study.

Results: Age of the study cases was 16-70 years with mean age of 48.37 ± 2.1 years. There were 34(56.7%) male and 26(43.3%) female cases. In 21(70%) cases of Group-A hospital stay was <5 days and in 9(30%) cases > 5 days. While in Group-B hospital stay was <5 days in all the cases (100%). In Group-A wound infection was reported in 3(10%) cases as compared to 1(3.3%) in Group-B. Mean improvement in lower back pain and leg pain on visual analogue scale (VAS) was higher in Group-B versus Group-A (4.7 ± 1.2 vs. 3.6 ± 1.5, P <0.001).

Conclusion: Both surgical techniques are good but lower infection rate and significant improvement in pain was reported in microdiscectomy versus open discectomy.

Key Words: Herniated lumbar disc, Conventional discectomy, Microdiscectomy, Lower back pain, Visual analogue pain scale

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INTRODUCTION

In our population frequency of herniated lumbar disc is much higher.[1] According to a previous literature on MRI herniated disc prevalence is 30%.[2] Symptomatic herniated lumbar disc is found in only 1-2% cases.[3] Symptomatic herniated disc is more frequently found in males. It is more common in 40-60 years of age. Such patients experience lower back pain initially that radiated to one of the lower limbs later on.[4] Lumbar disc herniation usually occurs between L4 and L5 or L5 and sacrum. Symptoms of herniated lumbar disc may involve lower back, thighs, buttocks, perianal region (due to perianal nerve), foot and toe. It affects more commonly sciatic nerve and less commonly femoral nerve. Such patients may feel numbness of one or both legs, burning sensation of legs and hips.[5] Radicular pain of legs occurs due to herniated disc pressing nerve roots. When sciatic nerve is involved pain radiates posterolaterally of the leg (L5, S1), while in femoral nerve involvement pain is felt in groin and anterior thigh (L2, L3, L4).[6] Abnormal sensations in genitalia, anus and perineal region with urinary bladder incontinence (cauda equine syndrome) or loss of motor function in lower limbs. According to recent literature only 5% cases with lower back pain have lumbar disc disease.[7] Absolute indication of surgery in such patients include abnormal urinary bladder function and progressive muscle weakness.[8] Usual indication of surgery is to relief pain and manage disability.[9] Our primary goal of surgery in such cases is to remove herniated disc material in the cases of disc prolapse, protrusion or extrusion. This study has been done to report the outcomes of microdiscectomy and conventional open discectomy in symptomatic lumbar disc disease so that surgeon may choose best surgical option for their patients knowing pros and cons of both techniques.

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MATERIALS AND METHODS

In this study 60 cases with symptomatic herniated lumbar disc were included. Study cases were equally

divided into two groups Group-A and Group-B (30 cases in each group). Patients in Group-A underwent conventional discectomy while those in Group-B underwent microdiscectomy. Outcomes in terms of post-operative infection rate and relieve in back and leg pain on visual analogue pain scale were compared of both groups. Adult patients of either gender were included in this study. Study sample was calculated using WHO sample size calculator. Sample selection was done using non-probability consecutive sampling technique. Ethical consent was taken from the hospital ethical board. Informed consent was taken from all the study cases.

Open discectomy was done under general anesthesia in prone position. About 2-3 inches incision (depending upon the surgeon choice) made over the skin. Muscles and tissue removed from the bone, exposing the area above and below the disc to get proper access to the affected disc without damaging nerve roots. Sometimes bone and ligaments are also removed to gain proper access to the disc, that is called laminotomy or laminectomy. Once disc was visualized, protruded part of the disc or any expelled disc fragment was removed. Hemostasis secured and incision closed with sutures.

In microdiscectomy small incision (1 inch) made in midline of the lower back. Muscles lifted off the bone without cutting them. Nerve root membrane removed and surgeon entered the spine using loupes. This is a minimal invasive technique without extensive tissue dissection and without removal or minimum removal of bone.

A self-made performa usd to enter the necessary data like age, gender, duration of lower back pain or leg pain, working status, smoking history, level of herniated disc and psychosocial aspects. P-value <0.05 was taken s significant and more than this as non-significant. Data was analyzed using SPSS software (version 24).

RESULTS

Total 60 cases were studied. Age of the study cases was 16-70 years with mean age of 48.37 ± 2.1 years. There were 34(56.7%) male and 26(43.3%) female cases. Each group contained equal number of cases (n=30). In 21(70%) cases of Group-A hospital stay was <5 days and in 9(30%) cases > 5 days. While in Group-B hospital stay was <5 days in all the cases (100%). In Group-A mean age was 47.7±3.2 years, mean operating time 72.8±2.2 minutes, mean time taken return to work 5.1 weeks and mean hospital stay was 2.3 days, while in Group-B mean age was 49.2±3.2 years, mean operating time 110.4±8.3 minutes, mean hospital stay 5.7 days and mean time taken return to work was 9.5 weeks. In Group-A wound infection was reported in 3(10%) cases as compared to 1(3.3%) in Group-B. Mean improvement in lower back pain and leg pain on visual analogue scale (VAS) was higher in Group-B versus Group-A (4.7 ± 1.2 vs. 3.6 ± 1.5, P <0.001). Patient satisfaction rate was higher in Group-B (92.4%) as compared to Group-A (80.7%). In this study there were 25(41.6%) cases with prolapsed disc at the level of L4-L5 and in 35(58.3%) cases L5-S1 level was involved.

Table No. 1: Age distribution of cases in study group

Age	Group-A	Group-B
<20 years	1 (3.3%)	0(00%)
21-40	6(20%)	5(16.7%)
41-60	19(63.3%)	18(60%)
>60	4(6.7%)	7(23.3%)

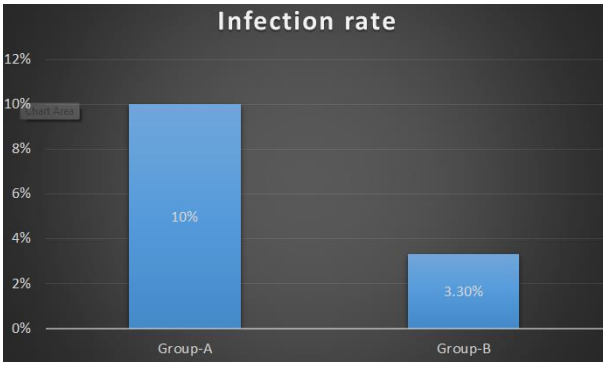

Figure No. 1: Post-operative infection rate in both groups

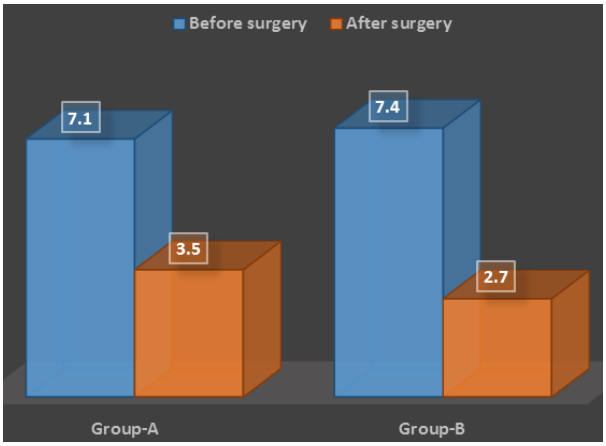

Figure No. 2: Improvement in pain on visual analogue pain scale (VAS) in both groups

DISCUSSION

This study was done to highlight the advantages of microdiscectomy over conventional discectomy. In this study male patients were more in number. In open conventional discectomy hospital stay was longer than microdiscectomy. This is in contrast to a previous study which stated prolonged stay in microdiscectomy than open discectomy.[10] An other study stated comparable results and reported average hospital stay of 4.8 days in microdiscectomy and about 15 days stay after open discectomy.[11] Whereas in our study hospital stay was less than 7 days in both groups. Previous literature

stated that there is low recurrence of disc herniation and reduced back and leg pain after microdiscectomy.[12] There is increased rate of recurrent disc herniation after open discectomy. Moreover increased risk of CSF leakage has been found in open discectomy and no such risk found in microdiscectomy.[13] There is risk of dural tear in microdiscectomy but with enhanced skills and surgeon experience this can be avoided.[14] According to our study results in 21(70%) cases of Group-A (conventional hospital stay was <5 days and in 9(30%) cases > 5 days. While in Group-B hospital stay was <5 days in all the cases (100%). In Group-A mean age was 47.7±3.2 years, mean operating time 72.8±2.2 minutes, mean time taken return to work 5.1 weeks and mean hospital stay was 2.3 days, while in Group-B mean age was 49.2±3.2 years, mean operating time 110.4±8.3 minutes, mean hospital stay 5.7 days and mean time taken return to work was 9.5 weeks. In Group-A wound infection was reported in 3(10%) cases as compared to 1(3.3%) in Group-B. Mean improvement in lower back pain and leg pain on visual analogue scale (VAS) was higher in Group-B versus Group-A (4.7 ± 1.2 vs. 3.6 ± 1.5, P <0.001. Patient satisfaction rate was higher in Group-B (92.4%) as compared to Group-A (80.7%). A study conducted by Pravesh in USA reported higher rate of wound infection in open technique versus only one case infected in microdiscectomy.[15] According to a tsuy conducted in Pakistan by khan et al stated that in long term outcomes both techniques discectomy at the level of L4/L5 and L5/S1 showed low complication rate and recurrence of disc herniation was just 6%.[16] A study conducted in China stated that except size of the incision other variables like mean hospital stay, mean operative time and neurological outcomes were same in both techniques.[17] These results are in contrast to our findings where we found that mean operative time, hospital stay and infection rate was higher in open technique than microdiscectomy. Previous study conducted in Japan by Masuda et al reported that recurrence rate of lumbar disc herniation was 12% and after microdiscectomy it was 7%.[18] Zahid et al reported that microdiscectomy is superior to open discectomy due to short hospital stay and reduced blood loss. Though both techniques have advantages and are effective but microdiscectomy is minimal invasive technique with less morbidity, reduced infection rate and patient can return to work earlier.[19] Badar et al in their study included 48.6% females and 51.4% males, with mean age of 48.3±6.7 years. There were 37.14% cases with prolapsed disc at the level of L4-L5 and in 62.86% cases L5-S1 level was involved.[20] Abdul Sattar et al conducted study on 50 cases with lumbar disc disease including 62% males and 38% females with mean age of 37.10±6.5 years. In their study mean pain score on VAS was improved from 4.8±2.1 and 7.4±1.8 to 0.9±1.6 and 0.7±1.3.[21]

CONCLUSION

Both Surgical techniques microdiscectomy and conventional open discectomy have their own advantages and disadvantages but both techniques are effective. According to our study results we found that microdiscectomy is better technique due to low infection rate, higher improvement in pain, shorter post operative hospital stay and reduced post operative infection rate.

Author's Contribution:

Concept & Design of Study:	Faisal Ali
Drafting:	Wasif Rizwan Malik, Awais Ur Rehman
Data Analysis:	Muhammad Umair Hashmi
Revisiting Critically:	Faisal Ali, Wasif Rizwan Malik
Final Approval of version:	Faisal Ali

Conflict of Interest: The study has no conflict of interest to declare by any author.

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