ORIGINAL ARTICLE

Comparison of Outcome in Microdiscectomy V/S Conventional Discectomy

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ABSTRACT

Objective: *To Compare surgical outcome of microdiscectomy V/S Conventional Discectomy.*

Study Design: *Experimental Randomized Controlled trail.*

Place and Duration of Study: *This study was carried out in Department of neurosurgery Lahore General Hospital Lahore Duration of Study was Six Months followed by Six Months Follow up.*

Sample Size: *Forty Patients for herniated Laumber Disc were Divided into two Group of 20 Each.*

Results: *Mean age of Patients range from 18 to 70 years in Group A (Open Discectomy) out of 20 Patients, 14 Patients (70%) stayed < 5 days and 6 Patients (30%). Stay in Hospital > 5 days. In Group B 20 patients (100%). Hospital Stay < 5 days. C.S.F leak in group A 5%. In group B No. CSF leak recorded in Group A 4 Patients (25%) wound infection. In Group B, 1 Patient (5%) wound infection.*

Conclusion: *Both techniques are equally good and effective but in term of hospital stay and wound infection microdisectomy showed better results than open discectomy.*

Keywords: *Microdiscectomy, Conventional Discectomy.*

INTRODUCTION

In Population the incidence of lumber disc herniations, including both asymptomatic and symptomatic, is more than 50% (Schoenfeldand Weiner, 2010). Althougth the prevalence of lumbar disc herniation in magnetic resonance imaging (MRI) studies reaches 30%, it clinically affects only 1 – 2% of the people throughout their life. Symptomatic lumbar disc herniation is more common in male and during the fourth and fifth decades of life. Natural history usually begins with a fluctuating lowback pain (LBP) that eventually radiates to one of the lower extremities. The pain usually spreads below the knee (Omidi – Kashani et al., 2014). Lumbar disc herniations occur in the lower back, most often between the fourth and fifth lumbar vertebral bodies or between the fifth lumbar and the sacrum.

Its symptom may affects the lower back, buttocks, thigh, anal/genital region (via the perineal nerve), and may radiate into the foot and/or toe. It affects the sciatic nerve or the femoral. Sciatic nerve is found more commonly affected in such patients and in patients with affected femoral nerve, symptoms like numbness, tingling feeling throughout one or both legs and even feet or even a burning feeling in the hips and legs are more common(Ernst et al., 2005). Radicular pain in the lower extremities results from the herniation of disc material into the spinal canal and resultant pressure on a nerve root. The constellation of symptoms can include numbness and weakness, but most often consists solely of leg pain that radiates posterolaterally below the knee from nerves Lumber 5 and S_1 (sciatica); or, less commonly, into the anterior thigh or groin from nerves L_2, L_3, and Lumber 4, (femoralgia). Sensory abnormalities in the genitals, anus, or perineum often coupled with loss of bladder control (cauda equine syndrome), as well as progressive loss of sensation or motor function in the legs, are ominous signs and warrant urgent evaluation and treatment (Schoenfeld and Weiner, 2010).

Lumbar disc prolapse, protrusion, and herniation

account for less than 5% of all low back problems, but are the most common causes of nerve root pain. Absolute indications for surgery include altered bladder function and progressive muscle weakness, but these are rare. The usual indication for surgery is to provide more rapid relief of pain and disability in the minority of patients whose recovery is unacceptably slow. The primary goal of surgical treatment for disc prolapse, protrusion, or extrusion is the relief of nerve root compression by removing the herniated nuclear material (Hirsch et al., 2009).

Open Discectomy

Open discectomy is usually performed under general in Prone Position during the procedure, the surgeon will make an approximately one – inch incision in the skin over the affected area of the spine. Muscle tissue is removed from the bone (lamina) above and below the affected disc and retractors hold the muscle and skin away from the surgical site so the surgeon has a clear view of the vertebrae and disc. In some cases bone and ligaments may have to be removed for the surgeon to be able to visualize and then gain access to the disc without damaging the nerve tissue. This is called a laminectomy or laminotomy depending on how much bone is removed.

Once the surgeon can visualize the lamina of the vertebrae, disc and other surrounding structures, he or she will remove the section of the disc that is protruding from the disc wall and any other disc fragments that may have been expelled from the disc. This is often done under magnification. No material is used to replace the disc tissue that is removed. The incision is then closed with sutures and the patient is taken to a recovery room.

Microdiscectomy

A microdiscectomy is performed through a small (1 inch) incision in the midline of the low back.

First, the back muscles (erector spinae) are lifted off the bony arch (lamina) of the spine. Since these back muscles run vertically, they can be moved out of the way rather than cut.

The surgeon is then able to enter the spine by removing a membrane over the nerve roots (ligamentumflavum), and uses either operating glasses (loupes) or an operating microscope to visualize the nerve root.

Lumbar herniated disc surgery is most commonly performed electively in patients where conservative therapies have failed to gain improvement of leg pain and disability. Short term results after surgical treatment of symptomatic lumbar herniated disc have been reported to have a high success rate (70 – 95%).

Factors as age, sex, smoking, duration of leg pain, working status, level of Herniated disc and psychosocial aspects have been investigated and demonstrated to be of importance for short-term results after surgery. On the other hand the long-term results after surgical treatment of symptomatic lumbar Herniated Disc have been found to have a lower success rate in about one third of the patients (30% to 40%) who report low back pain rather uncomfortable and restrictive. Regards to the comparison between different surgical treatments, a review of the literature demonstrates a greater reported incidence of long-term recurrent back and leg pain after aggressive disc removal but a greater reported incidence of recurrent disc herniation after limited disc removal (**Corriero et al., 2014).**

Surgical discectomies, either through an open approach or using the more modern microscopic approaches, are indicated for those patients with persistent incapacitating low back pain and sciatica after at least 6 weeks of treatment or in those with early or progressive neurological impairment.

Convectional discectomy can be complicated by dural tears, discitis, nerve root damage, and spinal instability, and postoperative convalescence can be lengthy (Hoffman et al, 1993).Surgeons, who perform the conventional discectomy, take into consideration the fact that degenerative disc materials left in the intervertebral disc space have a high incidence of rehernia-ation.

Thus, "microsurgical discectomy" is a term currently used to describe a surgical technique involving a small incision with minimal paravertebral muscle dissection using magnification, which may be either microscopic or using a loupe. This is considered the "gold standard" for the treatment of disc herniations (Righesso et al., 2007). The purported benefit of the minimally invasive approach is that it would allow patients to recover more quickly because of less tissue trauma. While a minimally invasive approach may seem ideal, there is a learning curve associated with execution of the procedure, patient safety, and outcome (Lau et al., 2011).

Recent advances in diagnostic imaging technology have allowed surgeons to avoid extensive vertebral explorations. As a result, less invasive surgical techniques have been developed. Microdiscectomy, which uses a magnifying scope, operating loupes, and head

lamps or endoscopes, allows for greater magnification and illumination of the operative field. Incisions are smaller, and anatomic disruption is minimized because little or no bone is removed. Minimally invasive techniques have the theoretical advantage of less tissue scarring and better visualization of the dura, roots and disc space, and hence are expected to have better post-operative outcomes. Microsurgery reportedly has fewer complications, faster recoveries, and fewer unsuccessful outcomes than does conventional discectomy. Risks, however, include missed disc fragments and operating at the wrong level (Majeed et al., 2013). Despite widespread use of this technique, there are few reports of long-term results. Early success rates ranging from 70 – 91% have been reported. Limited available data related to longterm follow-up demonstrates that the success rate decreases to 60 – 70% after three to ten years. However, these success rates may be influenced by post-operative care (Selkowitz et al., 2006).

Despite all of the technical refinements, surgical treatment of herniated discs still remains controversial. Although excellent results have been reported after discectomy, relief of low back pain has been less predictable. Only a small number of studies have compared the outcome of patients using the conventional discectomy and microdiscectomy techniques. In this study, we retrospectively analyzed whether minimally invasive microdiscectomy offers less morbidity and better outcome compared to conventional discectomy in treating lumbar disc herniations.

RESULTS

In this study, 40 patients were divided randomly into two groups on the basis of procedure performed. In both groups males and females ratio was same. Overall the patients were included in the study with ages ranging from 18 – 70 years.

In group A (Open Discectomy) mean age was 40.70 ± 10.58 years and in group B (Microdiscectomy) the mean age of patients was 42.30 ± 13.60 years (P value = 0.680).

Hospital Stay

In group A, from 20 patients 14 patients (70%) stayed for < 5 day and 6 patients (30%) stayed in hospital for > 5 days. In group B all 20 patients (100%) stayed in hospital for < 5 days.

In group A (Open Discectomy) the mean hospital stay was 4.90 ± 1.62 days and in group B (Microdiscectomy) it was 3.05 ± 1.23 days.

CSF Leak

In group A (Open Discectomy) from 20 patients, 18 patients (90.0%) had no CSF leak and 1 patient (5.0%) had CSF leak. In group B (Microdiscectomy) no CSF leak was recorded.

Table 3: *Distribution of patients according to treated group and CSF leak.*

	CSF		Total
Surgery Group	**No**	**Yes**	
Open Discectomy	18 (90.0%)	2 (10.0%)	20
Microdiscectomy	20 (100.0%)	0 (.0%)	20
Total	38 (95.0%)	2 (5.0%)	40
	p-value 0.487		

Chi square test 2.105

This variable had shown an insignificant statistical difference between the two groups. i.e. (P-value 0.487).

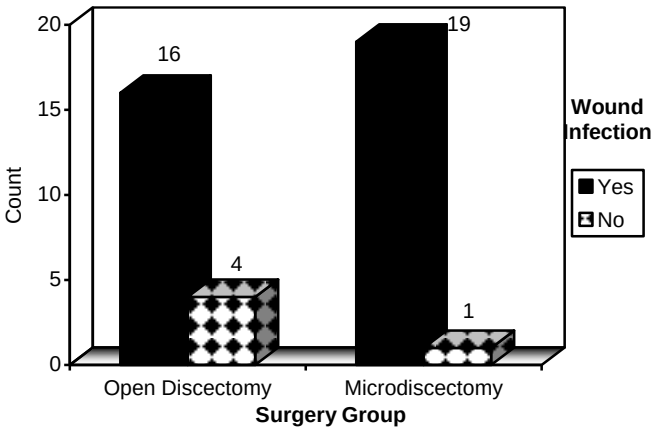

Fig. 1:

Wound Infection

Wound infection was seen in both groups. In group A (Open Discectomy) from 20 patients, there were 16 patients (75.0%) without wound infection i.e. normal healing and only 4 patients (25.0%) had wound infection. In group B (Microdiscectomy) 19 patients

(95.0%) had not wound infection i.e. normal healing, 1 patient (5.0%) had wound infection.

Table 4: *Distribution of Wound Infection in Both Groups.*

Wound Infection	Group A N (%)	Group B N (%)	Total N (%)
No	16 (75.0%)	19 (95.0%)	35 (87.5%)
Yes	4 (25.0%)	1 (5.0%)	5 (12.5%)
Total	20 (100.0%)	20 (100.0%)	40 (100.0%)
P value	0.342		

There is an insignificant statistical difference of wound infection between the two groups i.e. (P-value = 0.342).

DISCUSSION

This study was conducted to compare the advantages of micro-discectomy over open discectomy. The patients selected for the study among them most of the patients were male; another note able thing was the average age of male was less than the females.

In open discectomy the hospital stay was more than the micro discectomy. These results were in contrast to previous study which documented that the hospital stay of micro-discectomy patients was more than the open discectomy patients **(Righesso et al., 2007).** Whereas Chinese researcher results meets with our results, The average length of stay in micro-discectomy group was 4.8 days and in open discectomy it was 15 days (**Wu et al., 2006)**. In our study length of stay was less than a week in both groups. A recent study also states that micro discectomy patients had less back pain on the second post-operative In micro-discectomy the risk of recurrence is also minute. Reported Recurrence or recurrent disc herniation risk of patients treated with open discectomy was higher than the microdiscectomy. In open discectomy CSF leak was reported where as in micro discectomy no leak was reported. Literature reports the less complication of micro-discectomy. Dural tears were primarily complication in micro-discectomy, but with increased experience of neurosurgeons the complications have been diminished.

(Wu et al., 2006). In micro discectomy one patient was documented with wound infection whereas in open discectomy frequency of wound infection was high. Long term follow up studies have shown that, in overall discectomy surgeries, the complication rate in herniated lumber disc in $L_4 – L_5$ and $L_5 – S_1$ was very low and one year recurrence rate was only 6 percent. (Davis, 1994).

A study also supports our result as it reveals that except size of incision, operative time and length of hospital stay other parameters were approximately same. Results of both surgeries were neurologically same **(Righesso et al., 2007).** Previous study also supports the micro-discectomy because the in it the length of stay and blood lose was less than the open discectomy **(Wu et al., 2006).**

The study and the literature lead to the same point that both the discectomy techniques are very effective. But, micro discectomy, as it is minimal invasive technique is supported by neurosurgeons. In it the risk of wound infection and blood lose were minimum. Its also observed that CSF leak and Wound infection were not statistically significantly different in the both group but in micro discectomy the complication were less frequent than open discectomy.

On the basis of less complications and less hospital stay we could suggest the micro discectomy as the best treatment as compared to open discectomy.

CONCLUSION

Both techniques are equally good and effective but in term of hospital stay and wound infection microdisectomy showed better results than open discectomy.

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