

MSU Classification Based Microdiscectomy and Outcomes: A Follow Up Observational Study

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Structured Abstract

Background and Purpose: Back pain is one of the most common orthopaedic complaints that we see in our daily practice. Symptomatic Intervertebral Disc Prolapse occurs in 1–3% of the subjects, and a variety of treatment options are proposed. Recently, Microlumbar Discectomy has proven benefits in quality of life, reduction in pain scores, and efficacy in International Research. But decisional confusions for operative versus non-operative management based on the type of disc prolapse still persist. Hence, this study will be helpful in making MSU criteria more reliable and sensitive for operative decisions.

Material and Methods: This study is an Observational follow-up study that included 28 subjects who were selected using MSU Criteria and had microdiscectomy surgery performed at our hospital.

Various variables from previous literature include Age distribution, obesity and overweight, Height, Occupation, Sex, Level of prolapse, smoking influence, and Type of Prolapse.

The basic Aim of the study is to find out how efficacious this surgery is in Lumbar IVDP subjects, and assessment is done preoperatively and postoperatively with VAS and JAO scores.

Results: 37% of patients were severely affected and 64.3% were moderately affected, and post-surgery, their score pattern improved significantly. 96.4% of patients have >90% improvement, and 3.6% have only >50% improvement. (P value = 0.001).

85.7% of patients had improvement in neurology immediately and 6 months post-surgery (P Value = < 0.001).

Results and Conclusion: The study showed microdiscectomy based on MSU criteria is efficacious and improves the quality of life in patients with Lumbar IVDP. There has been a lacuna in the literature regarding this procedure in our part of the world, which highlights the significance of this study.

Keywords: IVDP, Lumbar, Microdiscectomy, Back Pain, JOA.

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Introduction and Literature Review

Low Back pain is one of the most commonly encountered orthopedic Problems all around the world. Disc prolapse, or degenerative disc disease, is one of the most common causes of back pain.

About 20% of patients in a 1,000-person population have disc Prolapse. This range increases to more than 50% in the elderly over 50 years. 40% of the population has some sort of Intervertebral Disc Disease on an MRI, which is alarming. Symptomatic disc disease is the only concern, and Clinical correlation with MRI is the most important step for the treating surgeon to decide. It has been described disc protrusions and their relevance to

sciatica and shown the effectiveness of operative treatment in 58 cases [1].

The rate of recurrent disc herniation ranges from 3 to 20% [3]. and it constitutes a major cause of failed back surgery syndrome. So these outcomes indicate that there are many factors involved in the outcome of lumbar disc surgery. Therefore, emphasis should be placed on proper patient selection [2]. Treatment for lumbar unilateral radicular pain with sonographically guided periradicular injections is feasible and successful [5]. A Shengxiang Study [4] According to the study, PELD with O-arm navigation assistance is a

safe, precise, and effective way to treat lumbar intervertebral disc herniation. It had benefits in reducing radiation exposure, surgical time, and the learning curve of PLED.

Patients who underwent surgery for a lumbar disc herniation achieved greater improvement than non-

operatively treated patients in all primary and secondary outcomes except work status [9].MSU Classification is used to describe "substantial" in terms of lumbar disc herniation on MRI.

In each series, types 2-B and 2-AB of herniation were more frequently selected for surgery.

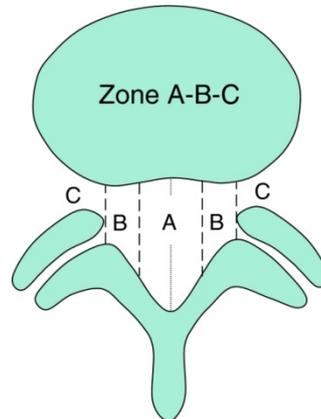


Figure 1: Zones ABC In MRI- Source [Eur Spine J. 2010 Jul; 19\(7\): 1087–1093.](#) Published online 2010 Jan 19. doi: [10.1007/s00586-009-1274-4](#)

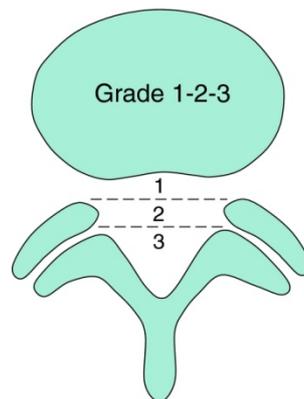


Figure 2: Canal Grades 1,2,3 Source : [Eur Spine J. 2010 Jul; 19\(7\): 1087–1093.](#) Published online 2010 Jan 19. doi: [10.1007/s00586-009-1274-4](#)

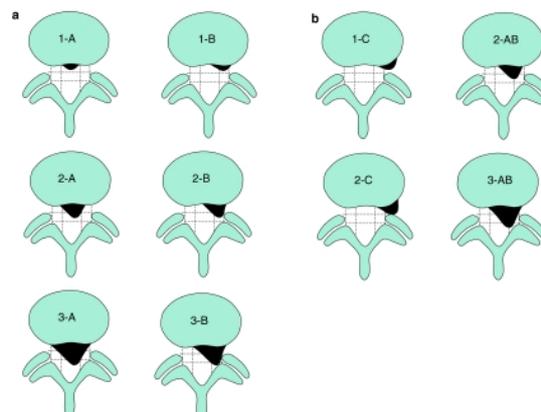


Figure 3: Combined classification Source [Eur Spine J. 2010 Jul; 19\(7\): 1087–1093.](#) Published online 2010 Jan 19. doi: [10.1007/s00586-009-1274-4](#)

Materials and Methods

Study Site

Department of Orthopaedic Surgery, Cosmopolitan Hospital, and Research Institute

Study Population

On the basis of MSU criteria, patients who underwent microdiscectomy for lumbar intervertebral disc prolapse underwent follow-up for six months.

Study Design

An observational cohort study follow-up study

Sample Size

The sample size is calculated after consulting with a biostatistician using EPI INFO software by WHO and CDC Atlanta, USA.

The estimated sample size will be 28.

Samples are selected based on inclusion and exclusion criteria.

Inclusion Criteria

Patients undergo microdiscectomy surgery for prolapsed lumbar intervertebral discs

Exclusion Criteria

Patients with Intervertebral Disc Prolapse associated with Structural scoliosis, Spondylolisthesis Congenital anomalies. Developmental dysplasia Infections of the spine

Caudaequina: multiple-level herniation Spinal cord tumors.

Methodology

Patients are selected as per the above-mentioned criteria and MSU criteria based on MRI.

Informed consent is taken, and the patient is asked to review for a serial assessment at 2 weeks and 6 months, respectively.

The patients are assessed based on the Japanese Orthopaedic Association scoring system and the

Visual Analogue Pain Scale both before and after treatment.

Various variables are assessed, including:

Outcome Variables

Japanese Orthopaedic Association backache score both before and after treatment (at immediate post-op, 2 weeks after surgery, and 6 months after surgery).

It includes:, Limb pain, ability to walk, low back ache

Clinical findings: SLRT, Sensory abnormality, Motor abnormality

Independent Variables

Age, Sex, BMI, Occupation, Etiology, Socioeconomic Status, Level of Prolapse, Smoking, Type of Prolapse, Weight, Height

Results

We have taken 28 patients who had undergone this procedure in our hospital as per criteria.

Age

The majority of patients in my study come under the middle age category (30–50) (69.9%) and others (30.1), and hence middle-aged people had a higher incidence of getting this condition.

The P value for the outcome of pain is statistically significant, meaning that the improvement of pain is better in middle-aged patients when compared to young patients.

Occupation

46.4% of people had a high and 39.3% had a medium type of occupation, as per ISCO.

Weight

In my study, 85% of the population fell into the obese or overweight category.

BMI

There was no significant difference in BMI or Level of Improvement as per the p value (0.069).

Symptoms

Table1: Symptoms Composition

Symptoms	Frequency	%
LBA + Leg pain	4	14.3
Leg pain + Ability to Walk problems	3	10.7
LBA + Ability to walk problems	3	10.7
LBA + ability to walk problems + Leg pain	18	64.3
Total	28	100

In this study most of the patients have all the three symptoms which include Low back ache, reduced walking distance, Leg Pain (64.3%) when compared to the separate groups.

Signs Composition

Table 2 : Signs and Composition

Signs	Frequency	Percent
SLRT + Sensory Abnormality	19	67.9
SLRT + Sensory + Motor abnormality	9	32.1
Total	28	100

In my study 32.1% population had SLRT, sensory and motor abnormality 67.9% population had SLRT and Sensory abnormality.

Level of Prolapse

Table 3:

Level Of Prolapse	Frequency	Percent
13-14	2	7.1
14-15	20	71.4
15-s1	6	21.4
Total	28	100

In my study 74% patients come under L4-L5 type of prolapse and 21.4 % comes under L5-S1

Table 4: Treatment Outcomes as Per Vas

Level Of Prolapse	Treatment Outcome of Pain As Per Vas				X ²	DF	P
	Not Improved		Improved				
	N	%	N	%			
13-14	0	0.0	2	100.0	1.344	2	0.511
14-15	3	15.0	17	85.0			
15-s1	0	0.0	6	100.0			
Total	3	10.7	25	89.3			

There was no significant difference in JOA score/patient improvement and level of prolapse.

There were significant improvement in pain in Extrusion and Sequestration groups when compared to other groups (p value 0.006).

Pre-surgery, Post Surgery, After 2 Weeks And After 6 Months.

Table 5:

JOA Score	Pre Surgery		Post-Surgery		Follow Up After 2 Weeks		Follow Up at 6 Months	
	N	%	N	%	N	%	N	%
0-5	10	35.7	0	0	0	0	0	0
5-10	18	64.3	1	3.6	3	10.7	3	10.7
10-15	0	0	27	96.4	25	89.3	25	89.3
Total	28	100	28	100	28	100	28	100

Table 6: Paired Comparison of JOA

Paired Comparison of JOA Score	Wilcoxon Signed Rank Test	
	Z	P
Pre surgery VS Post surgery	4.824	<0.001
Pre surgery Vs follow up after 2 weeks	4.882	<0.001
Pre surgery VS JOA score at 6 months	4.882	<0.001

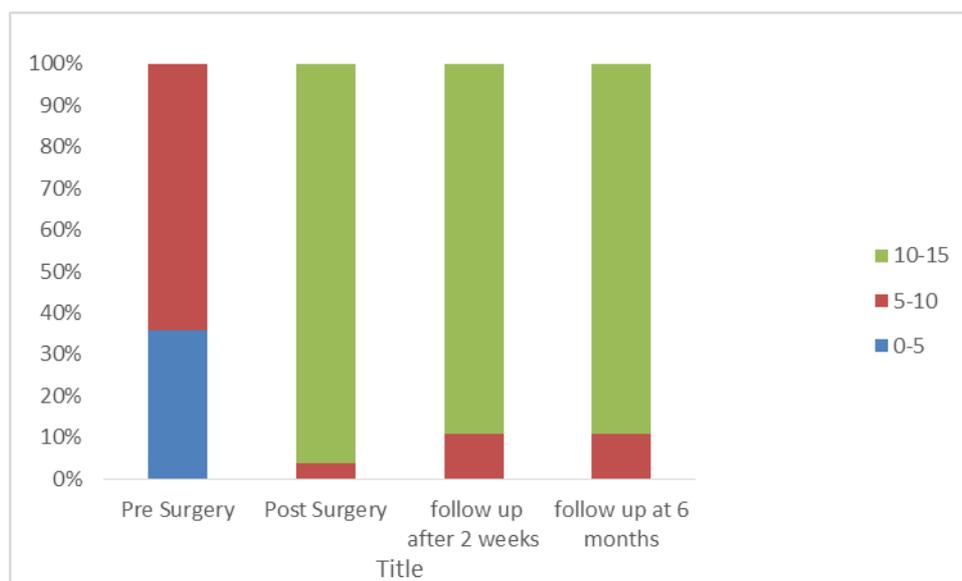


Figure 4: JOA Score Paired Comparison

In my study, 37% patients were severely affected and 64.3% were moderately affected and post surgery, their score pattern improved significantly post surgery 96.4% patients have >90% improvement and 3.6% have only >50 improvement.

Improvement of Pain as Assessed by Vas Score

89.3% patients have improvement in pain in my study who underwent surgery.

Discussion

Our study comprises 28 patients who were treated by Lumbar microdiscectomy for IVDP as selected by MSU criteria. The effectiveness of surgical treatment for sciatica has been shown in numerous investigations since 1934. In Weber's groundbreaking study, which excluded patients with "intolerable" pain and compared surgery with conservative care in a randomized clinical trial, the outcome of surgery was superior at the 1-year follow-up, but after 4 years, there was no longer a difference between the two.

According to research by Weber et al., Spengler et al., Davis et al., and Pappas et al., the majority of our patient population was male. In our study, there was the highest incidence of disc prolapse, i.e., 11 (39.3%), in patients of 40–50 years of age, and the most common level of involvement in our study was L4–L5 (71.4%), followed by L5–S1. Contrary to the findings of Mathi Hueme et al., who discovered that age greater than forty years was associated with a fair to poor outcome, there was a decline in the surgical study's outcome with younger age.

The results of this study demonstrated a successful outcome for lumbar disc prolapse with laminectomy and discectomy, which is comparable to other

discectomy procedures. In contrast to our work, which revealed that smokers had significantly worse post-operative recovery when compared to non-smokers, Radha Mehta and Himanshu Sharma's study demonstrates no statistical difference between smokers and non-smokers.

In the study by Madsbu MA, there was similar improvement in Obese and nonobese patients whose Euro-Qol-5 scores (0.48 vs. 0.49 points, $P = 0.441$), which was comparable to our study, where there was no significant difference in obese and nonobese patients with improvement after surgery (p value = 0.69).

In a study by Dewing CB, VAS scores improved significantly, which was comparable to our study, in which VAS scores for back pain and leg pain improved drastically. Disc herniations at L5 S1 had significantly greater improvement in their study, but on the contrary, there was no statistical difference between L5 S1 and L4 L5 in our study. Smokers had a significantly low return to activity, which is comparable to our study, in which smokers had a poor outcome.

In a study by Hossein Mashhadinezhad that was compared to ours, group 1 demonstrated strong findings, whereas group 2 demonstrated weak results.

The p value of our study shows that for age 0.10, which is significant when compared to the above-mentioned study, smoking had an influence on improvement in pain, which shows smokers have poorer results compared to non-smokers. The p value for our study is 0.10, which is significant when compared to

0.69, which is comparable to the above-mentioned study; influence on sex difference was not signifi-

cant (0.91), which was comparable to the above-mentioned study.

In our study, there was a very low prevalence of problems such as dural tears. Other complications reported did not occur in our study, i.e., discitis, increased neurological deficits, nerve root injury, pulmonary embolism, retroperitoneal injury, vascular injury, etc.

In our short-term study, 89.3% of participants had a good-to-excellent outcome, and 10.7% had a fair outcome; these results are close to those of Weber et al. and Spengler et al.'s short-term outcome studies. This could probably be attributed to proper selection of cases, an appropriate correlation between clinical assessments and imaging studies, and a valid indication for surgical intervention.

Following prodromal neck pain, postoperative headaches and a few uncommon incidences of postoperative seizures have been documented. All of these reported problems, which are thought to be attributable to increased epidural pressure from the endoscopic irrigation device, were treated conservatively. It has been suggested that endoscopic central decompression increases the likelihood of durotomy, possibly as a result of increasing visuospatial or tactile demands. In contrast, a more recent article reported that endoscopic methods were less likely to cause dural tears than MIS and open ones. The departing nerve root at the surgical level has also been associated with radicular discomfort and paresthesia, according to one study. Only a dural tear occurred as a complication in our study.

Conclusion

Microlumbar Discectomy in selected patients offers Excellent results as per MSU criteria. Patient Selection and Operating skills play an important role. Surgical Management should be considered if patients don't respond to conservative measures. From this study, it is clearly established that microlumbar discectomy is Efficacious with Minimal Complications and implies a high specific correlation with MSU criteria and good outcomes.

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