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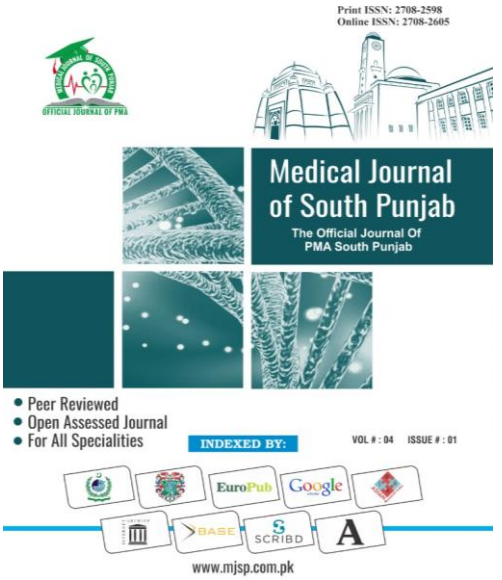

Surgical versus conservative treatment for lumbar disc herniation

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Authors and Affiliation:

Amajd Ali Qureshi[1*], Badar Uddin Ujjan[2], Tahir Shahab[3], [4]Abdul Rauf Mughal, [5]Syeda Khoula Azmat,[6]Habib Ullah

[1]PAQSJ Institute of Medical Sciences Gambat, Pakistan
[2]Dow International Medical College and Hospital Ojha Campus, Pakistan
[3]Gambat Institute of Medical Sciences Gambat, Pakistan,
[4]Gambat Institute of Medical Sciences Gambat Sindh, Pakistan,
[5]Dow University Hospital, Karachi Pakistan,
[6]Shahida Islam Medical College and Hospital, Lodhran, Pakistan
[*]Corresponding Author Email: drhabibullahkhan@live.com

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Original Article

Surgical versus conservative treatment for lumbar disc herniation

Amajd Ali Qureshi[1*], Badar Uddin Ujjan[2], Tahir Shahab[3], [4]Abdul Rauf Mughal, [5]Syeda Khoula Azmat,[6]Habib Ullah

[1]PAQSJ Institute of Medical Sciences Gambat, Pakistan
[2]Dow International Medical College and Hospital Ojha Campus, Pakistan
[3]Gambat Institute of Medical Sciences Gambat, Pakistan,
[4]Gambat Institute of Medical Sciences Gambat Sindh, Pakistan,
[5]Dow University Hospital, Karachi Pakistan,
[6]Shahida Islam Medical College and Hospital, Lodhran, Pakistan
[*]Corresponding Author Email: drhabibullahkhan@live.com

ABSTRACT

Objective: *to compare the long term and short-term outcomes of conservative and surgical treatment of sciatica symptom severity and improving quality of life among patients diagnosed with lumbar disc herniation.*

Methods: *Prospective observational cohort study was conducted at Shahida Islam Medical college and Hospital Lodharan. Overall, 180 patients were included in this study. The patients randomly divided as surgical group whereas patients in control group. Patients eligible for inclusion in the study were those aged 18 or older, diagnosed with low-back pain symptoms caused by lumbar disc herniation accompanied by radicular pain and demonstrating signs of nerve root irritation. The severity of sciatica symptoms was evaluated using the NASS questionnaire and quality of life with the SF-36.*

Results: *According to NASS back pain, less pain was observed in surgical group than control group at 6 weeks, 12 weeks, 1 year and 2 years after treatment, p>0.050. Surgical group has more response to treatment than control group at 6 weeks after treatment, 63.4% and 37.1%, respectively, (p=0.005). Whereas, after 12 weeks, 1 year and 2 years, both the groups had almost equal response to treatment, (p>0.050). Further, it was noted that surgical group and control group were almost equal with respect to NASS neurogenic, NASS functions, SF-36 physical functions and SF-36 mental functions.*

Conclusion: *Surgical treatment for lumbar disc herniation offered quicker relief from back pain symptoms compared to conservative therapy, yet failed to demonstrate superior benefits over conservative approaches during midterm and long-term follow-up periods.*

Keywords: *Conservative treatment, Disc herniation, Pain, Surgical treatment, Quality of life.*

1. INTRODUCTION

Sciatica, affecting approximately 30% of individuals over their lifetime, is characterized by intense unilateral leg pain surpassing accompanying low back discomfort[1], typically stemming from nerve root compression or irritation, leading to symptoms such as pain extending beyond the knee, diminished muscle strength following a myotomal pattern, and sensory impairments aligned with dermatomal distribution[2]. Patients with sciatica typically experience more persistent and severe pain compared to those with localized low back pain only, leading to a worse prognosis, increased healthcare resource utilization, longer periods of disability, and extended absences from work[3,4].

Lumbar disc herniation is a primary cause of sciatica, with lumbar discectomy being the most common surgical intervention in the USA[5], yet it's noteworthy that disc herniation often spontaneously regresses and occurs asymptomatically[6], while conservative treatments such as physical therapy, medication, and injections yield resolution in 90% of cases, preferred by most patients due to their lower complication risk compared to surgery[7].

Several studies comparing the efficacy of conservative and surgical management of sciatica due to lumbar disc herniation have encountered methodological challenges[8,9], particularly in observational cohort studies where differences in baseline prognostic indicators between treatment groups can lead to confounding, while randomized controlled trials (RCTs) are less susceptible to generating confounded results[10].

The findings of the study can help surgeons in developing individualized treatment plans for patients with lumbar disc herniation. Factors such as the severity of symptoms, patient preferences, comorbidities, and overall health status should be considered in determining the most suitable approach.

2. METHODOLOGY

This prospective observational cohort study was conducted within the routine clinical practice of the Department of Neurosurgery at Shahida Islam Medical college and Hospital Lodharan, Pakistan. All eligible patients were consecutively invited to participate in the study, with recruitment occurring between May 2023 and October 2023.Stidy was started after approval from ethical board and informed consent from patients.

Patients eligible for inclusion in the study were those aged 18 or older, diagnosed with symptomatic low-back pain caused by lumbar disc herniation accompanied by radicular pain and demonstrating signs of nerve root irritation, such as positive femoral nerve tension tests or straight leg raise, neurological deficits such as asymmetrical depressed reflexes or motor or sensory deficits corresponding to myotomal or dermatomal distribution, necessitating hospitalization. The diagnosis was confirmed through advanced spinal imaging (MRI or CT), revealing disc herniation at a level and side consistent with clinical symptoms and physical findings. The study cohort comprised patients who volunteered for participation in a standardized clinical follow-up program, involving consultations and patient-based outcome assessments, with available outcome data at either the 6 or 12-week follow-up assessment.

The severity of sciatica symptoms was evaluated using the NASS questionnaire and quality of life with the SF-36. Primary outcomes were changes in NASS back pain subscale scores at weeks 6 and 12.

Secondary measures included NASS neurogenic symptoms and function subscales, SF-36 physical and mental subscales, and the proportion of patients with a 50% reduction in NASS pain subscale scores. Data were collected at baseline, 6, 12, 52, and 104 weeks.

SPSS version 27 was used for data analysis and p values ≤0.05 was taken as significant after application of significant tests.

3. RESULTS

Overall, 180 patients were included in this study. The patients randomly divided as 145 (80.6%) surgical group whereas 35 (19.4%) patients in control group. The average age of surgical and control group was 54.55±5.52 years and 55.52±5.44 years, respectively, (p=0.351). The average BMI of surgical and control group was 27.48±1.65 kg/m^2 and 26.42±1.59 kg/m^2, respectively, (p=0.844). Further, both the study groups were almost equal with respect to gender, area of living, NASS and SF-36 parameters, (p>0.050). (Table. I).

According to NASS back pain, surgical group had less pain than control group at 6 weeks, 12 weeks, 1 year and 2 years after treatment, but the differences were statistically insignificant, (p>0.050). Surgical group has more response to treatment than control group at 6 weeks after treatment, 92 (63.4%) and 13 (37.1%), respectively, (p=0.005). Whereas, after 12 weeks, 1 year and 2 years, both the groups had almost equal response to treatment, (p>0.050). Further, it was noted that surgical group and control group were almost equal with respect to NASS neurogenic, NASS functions, SF-36 physical functions and SF-36 mental functions, with statistically insignificant differences, (p>0.050).(Table. II).

Table. I

Demographics and baseline characteristics of the study groups

Characteristics	Surgical 145 (80.6%)	Control 35 (19.4%)	p-value
Age (years)	54.55±5.52	55.52±5.44	0.351
BMI (kg/m^2)	27.48±1.65	26.42±1.59	0.844
Gender			
Male	93 (64.1)	24 (68.6)	0.622
Female	52 (35.9)	11 (31.4)	
Area of living			
Urban	69 (47.6)	17 (48.6)	0.917
Rural	76 (52.4)	18 (51.4)	
NASS			
Pain	7.51±1.38	7.07±1.54	0.109
Neurogenic symptoms	19.54±5.01	18.15±4.85	0.143
Function	26.49±3.69	26.52±3.91	0.964
SF-36			
Physical	27.14±3.62	27.13±4.89	0.995
Mental	51.32±6.39	49.94±7.13	0.266
N (%), Mean±S.D			

Table. II

Primary and secondary outcomes of the study groups

	Surgical 145 (80.6%)	**Control 35 (19.4%)**	**p-value**
NASS back pain			
6 weeks	4.44±1.55	5.41±1.54	0.911
12 weeks	4.72±1.25	5.81±1.49	0.682
1 year	4.63±1.23	5.54±1.03	0.651
2 years	4.71±1.22	5.42±1.05	0.205
Response to treatment			
6 weeks	92 (63.4)	13 (37.1)	0.005
12 weeks	54 (37.2)	13 (37.1)	0.991
1 year	59 (40.7)	16 (45.7)	0.588
2 years	67 (46.2)	14 (40.0)	0.508
NASS neurogenic			
6 weeks	18.64±2.11	18.58±1.85	0.893
12 weeks	16.52±1.42	16.38±1.58	0.598
1 year	16.44±1.74	16.61±1.64	0.600
2 years	15.51±2.44	14.54±1.96	0.031
NASS function			
6 weeks	16.64±1.71	16.81±1.32	0.599
12 weeks	15.81±2.16	15.68±2.22	0.748
1 year	12.91±3.44	13.62±2.41	0.246
2 years	12.74±1.58	12.78±1.22	0.878
SF-36 physical function			

6 weeks	34.48±5.85	35.48±5.41	0.359
12 weeks	38.03±6.82	39.31±6.78	0.324
1 year	40.77±5.28	41.71±5.03	0.343
2 years	42.51±6.35	45.96±4.31	0.013
SF-36 mental function			
6 weeks	52.31±5.48	51.96±4.32	0.726
12 weeks	48.58±4.01	49.36±3.54	0.288
1 year	40.86±6.55	53.81±6.28	0.017
2 years	48.68±7.85	47.01±6.41	0.243
N (%), Mean ± S.D			

4. DISCUSSION

Surgical treatment didn't show long-term benefits compared to conservative treatment for sciatica caused by lumbar disc herniation. Pain relief was quicker initially, but not sustained beyond 3 months. While physical impairment was lessened at 1-year follow-up for surgical patients, overall, surgery wasn't more effective for neurogenic symptoms or improving quality of life throughout the study.

Atlas et al[11] and Patrick et al[12] conducted previous observational studies, both of which found that surgical treatment leads to a quicker reduction in back pain compared to conservative treatment. This phenomenon of faster improvement in pain symptoms with surgical intervention is frequently observed in comparisons involving patients with lumbar disc herniation.

Weinstein et al[13] and Weber et al[14] found consistent results regarding quality of life, physical function and neurogenic symptoms, but other observational studies have reported inconsistent findings, with some indicating benefits of surgical management in these long term and short-term outcomes on follow-up. This variance in findings may stem from disparities in eligibility criteria, outcome assessment methods, control interventions, and statistical analysis approaches to control for confounding by indication.

Some researchers have raised concerns regarding the representativeness of patients who volunteer to participate in randomized controlled trials (RCTs) comparing surgical interventions to conservative treatments. Specifically, they question whether these trial participants accurately reflect the broader population of patients typically encountered in clinical practice[15]. This concern stems from the fact that RCTs often compare early surgical intervention with conservative or delayed surgical approaches in selected patient cohorts. As highlighted by Peul et al[16] the predominant focus of such trials may inadvertently skew participant demographics towards those more amenable to surgery or who have specific characteristics conducive to inclusion in the study protocol.

In a study by Gugliotta et al[17] reported that patients who underwent surgical treatment reported significantly less back pain at 6 weeks compared to those receiving conservative therapy. Additionally, the surgical group was more likely to report a ≥50% decrease in back pain symptoms from baseline to 6 weeks (48% vs 17%), and demonstrated less physical function disability at 52 weeks. However, other assessments showed minimal between-group differences with confidence intervals, including null effects.

The results of our observational cohort, conducted within a routine care setting, intriguingly mirror the findings of previous randomized controlled trials (RCTs). Specifically, these RCTs have consistently indicated a more rapid reduction in pain among patients who underwent surgery. However, similar to our observational cohort, these trials have not demonstrated a clear superiority of surgery over

conservative treatment in the long-term evaluation of neurogenic symptoms, physical function, or overall quality of life[18, 19, 20].

Limitations: The study has been limited by financial or resource constraints, which could affect the sample size, follow-up duration, or the ability to implement standardized treatments and outcome assessments. These limitations may compromise the study's internal and external validity.

5. CONCLUSION

Surgical treatment for lumbar disc herniation offered quicker relief from back pain symptoms compared to conservative therapy, yet failed to demonstrate superior benefits over conservative approaches during midterm and long-term follow-up periods.

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