



## LUMBAR DISC HERNIATION: EARLY SURGERY VERSUS PROLONGED CONSERVATIVE TREATMENT.

Urooj Fatimah Siddiqui<sup>1</sup>, Muhammad Faiq Ali<sup>2</sup>, Muhammad Asim Khan Rehmani<sup>3</sup>, Atiq Ahmed Khan<sup>4</sup>, Sheeraz Ahmed Ghori<sup>5</sup>, Qazi Muhammad Zeeshan<sup>6</sup>, M. Imran<sup>7</sup>

1. FCPS  
Fellow of Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.
2. FCPS  
Assistant Professor Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.
3. FCPS  
Assistant Professor Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.
4. FCPS  
Professor of Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.
5. FCPS  
Assistant Professor Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.
6. FCPS  
Assistant Professor Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.
7. FCPS  
Professor of Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.

### Correspondence Address

Dr. Muhammad Faiq Ali  
Department of Neurosurgery  
Dow University of Health Sciences,  
Civil Hospital Karachi.  
salamfaiq@hotmail.com

### Article received on:

22/02/2019

### Accepted for publication:

09/04/2020

**ABSTRACT...** We seek to compare pain sensation after surgical and conservative treatment in patients having sciatica with lumbar disc herniation in a routine clinical setting. **Objectives:** To compare the outcome of early surgical intervention versus prolonged conservative treatment in patients with sciatica due to herniated lumbar intervertebral discs. **Study Design:** Randomized Control Trial. **Setting:** Department of Neurosurgery, Dow University of Health Sciences, Civil Hospital Karachi. **Period:** Aug 1, 2017 till May 31, 2018. **Material & Methods:** Data was prospectively collected from patients after taking a consent. A total of 70 patients, with 35 patients in each Group A (early surgical intervention) and Group B (prolonged conservative treatment) were included. Demographic data was presented as simple descriptive statistics giving mean and standard deviation and qualitative variables were presented as frequency and percentages. P-value of  $\leq 0.05$  was taken significant. Effect modifiers were controlled through stratification to see the effect of these on the outcome variable. Post stratification independent t-test was applied taking p-value of  $\leq 0.05$  as significant. **Results:** Mean age in group A and B was  $45.18 \pm 7.64$  and  $42.78 \pm 5.87$  years respectively. 30 (85.7%) were male and 05 (14.3%) were female in group A. 28 (80%) were male and 07 (20%) were female in group B. Mean pre and post VAS score in group A was ( $7.18 \pm 0.71$  and  $2.18 \pm 0.55$ ) and group B was ( $7.78 \pm 0.34$  and  $3.26 \pm 0.21$ ). Mean pre and post SF36 BP score in group A was ( $24.18 \pm 3.81$  and  $65.54 \pm 6.14$ ) and group B was ( $34.29 \pm 4.91$  and  $68.21 \pm 5.87$ ). **Conclusion:** Many patients continue to refer conservative treatment of sciatica, despite of pain but given the results of this study, early surgical intervention appears to be superior to medical management for the treatment of Sciatica with respect to patient outcome.

**Key words:** Early Surgical Intervention, Prolonged Conservative Treatment, Sciatica, Visual Analogue Score.

**Article Citation:** Siddiqui UF, Ali MF, Rehmani MAK, Khan AA, Ghori SA, Zeeshan QM, Imran M. Lumbar disc herniation: Early surgery versus prolonged conservative treatment. Professional Med J 2020; 27(9):1784-1789.  
**DOI:** 10.29309/TPMJ/2020.27.09.3309

## INTRODUCTION

Sciatica is a form of leg pain, with or without focal neurological deficit, radiating down the leg<sup>1</sup> on one or both sides. Its prevalence, as reported in literature, varies from 1.6 to 43%.<sup>2,3</sup> In most of cases, sciatica is due to herniation of disc leading to nerve root compression. However, other possible causes include lumbar canal stenosis or foraminal stenosis and less often tumors or cyst.<sup>3,4</sup> Lumbar disc herniation is protrusion of nucleus pulposus and annulus fibrosus far away from intervertebral disc space. Peak prevalence is between ages of 30-50 years with male to female ratio of 2:1.<sup>5</sup>

Management of sciatica is variable considerably. In many patients spell of low back pain resolve spontaneously in approximately 25-58% of cases, even with herniated discs. Hence, non-surgical approach is the prior step in its management.<sup>6</sup> Duration varies from 3 to 6 months. Conservative treatment includes analgesics, physiotherapy and life style modifications. If symptoms persist or worsen, then patient eventually undergo surgery, after necessary imaging requirements (MRI).<sup>2</sup> Surgical intervention is indicated if lumbar disc herniation is causing intractable pain or patient is having progressive focal neurological deficits and MRI findings are consistent with clinical findings of patient.<sup>2</sup> The type of surgery

performed are standard open discectomies or micro discectomies with or without operating microscope. Minimally invasive techniques include endoscopic discectomies.

Jo Jordan et al in a systematic review suggested that herniated portion of disc regresses in 6 months partially or completely in two-third of patients with conservative treatment. However in this review, one of RCT showed baseline VAS of two groups i.e. early surgical intervention versus prolonged conservative treatment as 67.2 vs. 64.4. After surgery vs. treatment, VAS was 10.2 vs. 27.9 and difference in mean change came out to be 57 vs. 36.5. In similar review, baseline SF36 BP of early surgical intervention versus prolonged conservative treatment was 21.9 vs. 23.9. After surgery vs. treatment, BP was 62.8 vs. 54.4 and difference in mean change was 40.9 vs. 30.55. Kovacs et al in a systematic review of 5 RCTs showed that early decompressive surgeries resulted in good outcome. In one of its RCT, Patient's global assessment showed good result with surgery as 73.1% vs. 35.9% in control group (Zuckerman et al). Difference in mean change for SF36 Bodily Pain (BP) was 17.8 (12.5 to 23) vs. 1.5 (-4.2 to 7.3), (Weinstein et al), thus favoring surgery.<sup>7</sup> Jon D Lurie et al in SPORT study demonstrated that mean change for early surgery versus non-operative treatment in BP was 42 (2) vs. 38.2 (2).<sup>8</sup>

Vincent JA et al in a literature review showed that optimal timing for surgery is between 4 & 8 weeks after radicular symptoms.<sup>9</sup> Regarding outcome of lumbar disc surgery, study was conducted by Mahsa S, in which VAS reported as a whole 93.3% favorable results for decreased in sciatic pain.<sup>10</sup> MichielBlequin et al in a RCT concluded that in selected cases, conservative treatment might provide a possibility of reducing pain and disability without undergoing surgery, but with a persistent risk of delayed surgery if there is failure of prolonged conservative treatment.

Furthermore outcome of treatment with respect to timing of intervention or prolonged conservative care has not been previously evaluated properly. In spite of several randomized controlled trials

(RCTs) that have been published that have compared the effectiveness of early surgery versus prolonged conservative treatment, there is still ambiguity in its definitive management. On literature search, it is also noted that data regarding surgical versus conservative management for this problem in our population is limited. Consensus regarding early surgical intervention for sciatica has not been established.

Due to variation in genetic, geographic and demographic basis, there is better need to assess the better treatment modality with good outcome for our population. Therefore it provides strong reason to the study as our primary aim is to simultaneously compare the clinical outcome of early surgery versus prolonged conservative treatment, in order to identify the best possible treatment for reducing morbidity and sufferings of patients with sciatica to improve the quality of life.

## OBJECTIVE

To compare the outcome of early surgical intervention versus prolonged conservative treatment in patients with sciatica due to herniated lumbar intervertebral discs.

## MATERIAL & METHODS

This was a Randomized Control Trial (Randomization through sealed envelope technique).

The Study was conducted at Department of Neurosurgery, Dow University of Health Sciences, Civil Hospital Karachi during Ten months, starting from 01-08-17 till 31-05-18.

By using open EPI sample size calculator, taking statistics for bodily pain score (BP) in group A as 40.9 (14.5) and in group B as 30.5 (16.1), power to test as 80%, with confidence interval 95%, the calculated sample size will be 35 in each group<sup>5</sup>. Total sample size will be 70.

**SAMPLING TECHNIQUE:** Non Probability consecutive sampling.

Patients, between 25-50 years, who presented with radicular leg pain and a positive SLR with

duration of symptoms <4 weeks having herniated intervertebral disc at any of L4-S1 level, diagnosed on MRI, were included in this study.

Patients with known co-morbid (like DM, IHD, HTN), degenerative spine (like listhesis), infective pathology (like Pott's disease), spinal tumors, recurrent cases, cauda equina syndrome and traumatic/pathological fractures, were excluded from this study.

### Mean change in visual analog scale (VAS)

VAS comprises of a horizontal line of 10cm/100mm and it is divided into segments with sequential labels; 0 (no pain) to 10 (worst pain). Patient is asked to mark his pain level on it.

In this study, mean pain score (VAS) will be recorded before intervention/therapy (baseline) and then on 10th day after surgery/completion of therapy. Outcome will be measured as difference in mean change of pain score (VAS).

### Mean change in SF36 bodily pain (BP)

Lower scores mean more disability, higher scores mean less disability<sup>12</sup>.

In this study, we will include bodily pain (BP) score to assess outcome of early surgical intervention vs. prolonged conservative treatment. BP has 2 questions. Each question has a score and after averaging these scores they are charted on scale.

Mean pain score (BP) will be recorded before intervention/therapy (baseline) and then on 10th day after surgery/completion of therapy. Outcome will be measured as difference in mean change of pain score (BP).

## RESULTS

A total of 70 patients, diagnosed as sciatica due to herniated intervertebral disc, visited Department of Neurosurgery, Dow University of Health Sciences, Civil Hospital Karachi and met the inclusion and exclusion criteria of this study.

Out of 35 patients in group A, minimum age of the patient was 32 while maximum age of the patients was 54 years. Mean age in our study was 45.18

years with the standard deviation of  $\pm 7.64$ . Mean duration of sciatica symptoms in our study was  $2.78 \pm 0.78$  weeks. Similarly, out of 35 patients in group B minimum age of the patient was 32 while maximum age of the patients was 54 years. Mean age in our study was 42.78 years with the standard deviation of  $\pm 5.87$ . Mean duration of sciatica symptoms in our study was  $3.26 \pm 0.51$  weeks.

Out of 35 patients in group A mean pre and post VAS score in our study was  $7.18 \pm 0.71$  and  $2.18 \pm 0.55$  respectively. Similarly, out of 35 patients in group B mean pre and post VAS score in our study was  $7.78 \pm 0.34$  and  $3.26 \pm 0.21$  respectively. P-value was 0.12. As shown in Table-I.

Variable	Mean	Standard Deviation	P-Value
Pre-vas score in group A	7.18	$\pm 0.71$	0.12
Post-vas score in group A	2.18	$\pm 0.55$	
Pre-vas score in group B	7.78	$\pm 0.34$	
Post-vas score in group B	3.26	$\pm 0.21$	

Table-I. Pre and post vas pain score in group A and B.

Out of 35 patients in group A mean pre and post SF36 BP score in our study was  $24.18 \pm 3.81$  and  $65.54 \pm 6.14$  respectively. Similarly, out of 35 patients in group B mean pre and post SF36 BP score in our study was  $34.29 \pm 4.91$  and  $68.21 \pm 5.87$  respectively. P-value was 0.25. As shown in Table-II.

Variable	Mean	Standard Deviation	P-Value
Pre-sf36 BP score in group A	24.18	+3.81	0.25
Post- sf36 BP score in group A	65.54	$\pm 6.14$	
Pre- sf36 BP in group B	34.29	+4.91	
Post- sf36 BP score in group B	68.21	$\pm 5.87$	

Table-II. Pre and post SF36 BP score in group A and B.

In Group A, 85.7% of patients were male and 14.3% were female. However, in group B 80% of patients were male and 20% were female.

In Group A, 40% and 60% of patients were in age group 25-40 years and 41-55 years respectively. Whereas, in Group B, 48.6% and 51.4% of patients

were in age group 25-40 years and 41-55 years respectively.

Frequency distribution of duration of symptoms showed that in Group A 22.9% and 77.1% had the symptoms for < 2 weeks and > 2 weeks respectively. Whereas, in Group B, 48.6% and 51.4% had the symptoms for < 2 weeks and > 2 weeks respectively.

Frequency distribution of affected side of leg showed that in Group A, 42.9% and 57.1% had right and left side affected, respectively. Whereas, in Group B, 28.6% and 71.4% had right and left side affected, respectively. As in Figure-1.

Frequency distribution of level of herniated disc showed that in Group A, 77.1% and 22.9% had L4-5 and L5-S1 level of herniated disc, respectively. In Group B, 68.6% and 31.4% had L4-5 and L5-S1 level of herniated disc, respectively. As in Figure-2

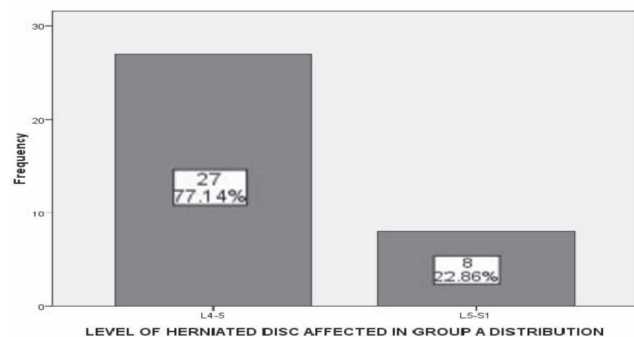


Figure-1

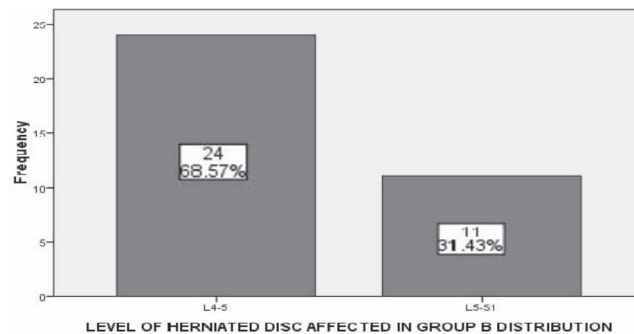


Figure-2

Stratification for gender with respect to VAS pain score showed that in the male group A, pre and post VAS pain score were  $6.97 \pm 1.25$  and

$1.54 \pm 0.45$  respectively. Similarly in the male group B, pre and post VAS pain score were  $7.24 \pm 1.65$  and  $1.78 \pm 0.54$  respectively. P-value was 0.01. Stratification for gender with respect to VAS pain score showed that in the female group A, pre and post VAS pain score were  $7.65 \pm 1.84$  and  $2.25 \pm 0.28$  respectively. Similarly in the female group B, pre and post VAS pain score were  $8.51 \pm 1.21$  and  $4.87 \pm 1.07$  respectively. P-value was 0.24. As presented in Table-III.

Gender	Pre and post VAS score group A		Pre and post VAS score group B		P-Value
	Pre	Post	Pre	Post	
Male	6.97	1.54	7.24	1.78	0.01
Female	7.65	2.25	8.51	4.87	0.24

Table-III. Pre and post VAS score according to gender.

Stratification for gender with respect to SF36 BP score showed that in the male group A, pre and post SF36 BP score were  $24.88 \pm 7.21$  and  $66.34 \pm 14.65$  respectively. Similarly in the male group B, pre and post SF36 BP score were  $33.23 \pm 7.61$  and  $67.18 \pm 13.44$  respectively. P-value was 0.00. Stratification for gender with respect to SF36 BP score showed that in the female group A, pre and post SF36 BP score were  $24.76 \pm 6.56$  and  $65.77 \pm 17.83$  respectively. Similarly in the female group B, pre and post SF36 BP score were  $35.18 \pm 6.91$  and  $64.09 \pm 13.12$  respectively. P-value was 0.10. As presented in Table-IV.

Gender	Pre and post SF36 BP score group A		Pre and post SF36 BP score group B		P-Value
	Pre	Post	Pre	Post	
Male	24.88	66.34	33.23	67.18	0.00
Female	24.76	65.77	35.18	64.09	0.10

Table-IV. Pre and post SF36 BP score according to gender.

Stratification for age, duration of symptoms and side of leg with respect to VAS pain score and SF36 BP score were found to be statistically insignificant.



## DISCUSSION

Sciatica is one of the most crippling form of low back pain, with a lifetime incidence of  $\approx 30\%$ . It is the result of mechanical compression or irritation of one of the lumbar nerve roots. Its symptoms normally include pain, sensory and / or motor dysfunction. Leg pain is generally unilateral and is usually more than associated low back pain and specifically radiates below the knee. There may be territorial sensory and / or motor neurological deficits related to the nerve root involved. Individuals having sciatic pain if compared with people with localized low back pain only, have usually greater persistence as well as severity of pain. These individuals utilize greater healthcare resources and generally are disable and absent from work for a prolong period of time.

Out of a total of 70 patients presenting visiting Department of Neurosurgery, Civil Hospital, Karachi were included in this study. Mean age in group A and B was  $45.18 \pm 7.64$  and  $42.78 \pm 5.87$  years respectively. 30 (85.7%) were male and 05 (14.3%) were female in group A. 28 (80%) were male and 07 (20%) were female were female in group B. Mean pre and post VAS score in group A was ( $7.18 \pm 0.71$  and  $2.18 \pm 0.55$ ) and group B was ( $7.78 \pm 0.34$  and  $3.26 \pm 0.21$ ). Mean pre and post SF36 BP score in in group A was ( $24.18 \pm 3.81$  and  $65.54 \pm 6.14$ ) and group B was ( $34.29 \pm 4.91$  and  $68.21 \pm 5.87$ ).

A meta-analysis of 19 articles having 2272 participants in which such patients compared with conservative treatment, surgical treatment was found to be more successful in decreasing pain, ameliorating function and improving quality of life. No statistically notable dissimilarity was noticed in adverse events.<sup>13</sup>

A study from Netherland in which 283 patients were randomly distributed into early surgery vs prolonged conservative treatment concludes that the first year end results were comparable for patients allocated to early surgery and those designated to prolong conservative treatment with ultimate surgery if required, but the speed of pain remission and of perceived recovery were quick for patients grouped into early surgery.<sup>14</sup>

In another concurrent prospective randomized and observational cohort study, it was concluded that prudently chosen patients who went through operation for a lumbar disc herniation accomplished substantial amelioration than conservatively treated patients; there was very small to no degradation of outcomes in either group (operative and conservative) from 4 to 8 years.<sup>15</sup>

Surgical management of sciatica in patients when compared with prolonged conservative treatment showed improvement in functional status.

## CONCLUSIONS

Many patients are willing to undergo conservative treatment for sciatica, despite of ongoing pain because of their reservation about surgery but given the results of this study, early surgical intervention is superior to medical management for sciatica regarding patient outcome. The insufficiency of data does not substantiate the selection of suitable time in our contemporary recommendations. Further studies on large scale will provide the answer for selection of patients for surgery versus conservative treatment. Furthermore, financial and economic analysis should be done for possible quick recovery versus cost and complications associated with surgery. Although surgeons may select management options on individual case, data should be evaluated for the method of selection of procedure by various surgeons as there may be a possibility of conflict of interest for surgeons who regularly operate those patients who may benefit from conservative care. Future long-term prospective, multi-center studies are needed to solve these issues.







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### AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Urooj Fatimah Siddiqui	Study design.	
2	Muhammad Faiq Ali	Introduction.	
3	M. Asim Khan Rehmani	Data collection, analysis interpretation.	
4	Atiq Ahmed Khan	Proof reading and research plan.	
5	Sheeraz Ahmed Ghori	Data analysis, sample collection.	
6	Qazi M. Zeeshan	Data analysis, sample collection.	
7	M. Imran	Research plan and supervision.	