Comparative effectiveness of surgical and Non-surgical management for patients with single level lumbar disc herniation in terms of symptom severity and quality of life

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Abstract

Introduction: Sciatica is one of the most severe form of low back pain, with a lifetime prevalence of approximately 30 percent. To assess the short-term and long-term efficacy of surgical and conservative care in the incidence of sciatic symptoms and quality of life in standard clinical settings in patients with lumbar disc herniation.

Material and method: It is a retrospective study conducted at Medical Trust Hospital, Kochi who underwent micro lumbar discectomy for single level lumbar disc herniation, and of those with the same diagnosis but who refused surgery or were still waiting for the surgery to be scheduled. The patients were divided into two groups as Group A- treated surgically and Group B – awaiting for surgery and managed non-surgically. Cases between 20-60 years of age, male or female, with low back pain and lower limb radiculopathy, positive signs of root tension (SLRT between 30-70 degrees or severe femoral root stress), associated neurological dysfunction (with respect to corresponding abnormal reflexes, reduced sensation in dermatomal distribution or weakness in myotomal distribution) and multiple disc herniation cases if only one of the level was symptomatic, were included. The study excluded patients with scoliosis of more than 15 degrees, segmental instability, spondylolisthesis, spine or tumor infection, psychiatric disease, refusal of patients and age < 20 and > 60 years. After obtaining the written informed consent from all recruited patients, a clinical evaluation by means of established questionnaires which included the Short Form 36 (SF36), 16 the Oswestry Disability Index (ODI), 17 and the visual analog scale for pain (VAS). Patients were grouped into: Group A, for those who had already undergone surgical treatment and Group B, those awaiting surgery.

Results: Total 60 patients fulfilling the inclusion criteria were included in present study. Mean age of the patients in Group A was 36.7 ± 5.8 and in Group B was 37.01 ± 5.56 years. Male preponderance was observed in our study with male to female ratio of 1.7:1. At the time of admission, patients in both the groups suffered similar scale of pain and agony. The VAS and ODI did not show significant difference in the pain and disability in both group of patients. During follow-up of 6month and 2 years, surgically treated patients showed a significant improvement in the scores of VAS and ODI. Also the SF-36 also showed a similar results and was better in patients treated by surgery contrary with conservative treatment.

Conclusion: The study concluded with positive benefits from surgery with a reduction in pain reported in the lower limbs (VAS leg with $p<0.05$) and improved function (Oswestry with $p<0.05$); however, it did not show any much significant change in quality of life according to the SF-36 scale.

Key words: Oswestry Disability index (ODI), Lower Back Pain, Lumbar Disc Herniation, Sciatica, Short Form-36 (SF-36), Visual Analog Scale (VAS)

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Introduction

Sciatica is a disorder caused by lumbar nerve root compression or irritation. Common symptoms and signs include unilateral leg pain, reduced muscle strength in the myotomal distribution, and sensory deficits.[1,2] Sciatica is one of the severe form of low back pain, with a lifetime prevalence of as much as 30 percent.[3,4]

According to the Institute for Clinical Systems Improvement guideline on adult acute and subacute back pain,[5]the mainstays of therapy are reassurance and patient education,[6,7] activity modification to limit disk loading, non-steroidal anti-inflammatory drugs (NSAIDs) and/acetaminophen,[8,9,10]and a gradual return to physical activity.

The aim of nonsurgical treatment for acute low back pain is a return to baseline functional status while effectively controlling pain. In general, the effect sizes for established conservative interventions in acute low back pain are fairly small, and there is limited evidence at best for several adjunct interventions such as acupuncture, spinal manipulation, transcutaneous electrical nerve stimulation, or lumbar traction.[11,12]

Lumbar discectomy remains one of the most commonly performed procedures.[13,14] and the outcomes are considered excellent for patients who are good surgical candidates.

For patients without severe neurological deficits, however,determining who should undergo surgery is not as clear. Because most cases (>85% at 6 weeks) ofback pain (including those from disk herniation) are self-limited and would resolve with nonsurgicaltreatment in the first place, there is no reliable way to predict which patients will benefit from surgicalintervention.[15]

The aim of this study is to compare the efficacy of thesurgical treatment in patients who have single level lumbar disc herniation with the patients who have a surgical indication but were still waiting to undergo the procedure or wanting the conservative treatment.

Objectives: To assess the short-term and long-term efficacy of surgical and conservative care in the management of sciatic symptoms and quality of life in standard clinical settings in patients with lumbar disc herniation.

Material and Methods

Following approval by the Ethical committee from the Institutional Review Board, a retrospective search was done, of the medical records of patients in medical follow-up at the Medical Trust Hospital, Kochi who underwent micro lumbar discectomy for single level lumbar disc herniation, and of those with the same diagnosis but who refused surgery or were still waiting for the surgery to be scheduled.

Cases between 20-60 years of age, both male and female, with low back pain with lower limb radiculopathy, positive signs of root tension (SLRT between 30-70 degrees or severe femoral root stress), associated neurological dysfunction (asymmetric depressed reflex, reduced sensation in dermatomal distribution or weakness in myotomal distribution) and multiple herniation cases if only one of the hernia was symptomatic, were included. The study excluded patients with scoliosis of more than 15 degrees, segmental instability, spondylolisthesis, spine or tumor infection, psychiatric disease, refusal of patients and age < 20 and > 60 years. All patients recruited had to fill the consent and a clinical evaluation by means of established questionnaires which included the Short Form 36 (SF36),[16] the Oswestry Disability Index (ODI),[17] and the visual analog scale for pain (VAS).Then were grouped into: Group A, for those who had already undergone surgical treatment and Group B, those awaiting surgery.

The Short Form (36) Health Survey is a 36-item, patient-reported survey of patient health. The SF-36 consists of eight scaled scores (functional capacity, physical aspects, pain, general state of health, vitality, social aspects, emotional aspects, and mental health.), which are the weighted sums of the questions in their section. Each scale is directly transformed into a 0-100 scale on the assumption that each question carries equal weight. The lower the score the more disability. The higher the score the less disability

The ODI is used for functional assessment of the lumbar spine, incorporating measurements of pain and physical activity. The scale consists of 10 questionswith six alternatives. The first question evaluates pain intensity andthe other nine, the effect of pain on day-to-day activities.

Statistical analysis:All the data was collected and data entry was done in Excel. Data analysis is conducted using version 23 of SPSS Software. Quantitative data is presented with the aid of Mean ± SD. Significance of mean difference was analysed using student t-test. P-value less than 0.05 is considered significant.

Results

Total 60 patients fulfilling the inclusion criteria were included in present study. The patients were divided into two groups as Group A- treated surgically and Group B – awaiting for surgery and managed non-surgically. Mean age of the patients in Group A was 36.7 ± 5.8 and in Group B was 37.01 ± 5.56 years. Male preponderance

was observed in our study with male to female ratio of 1.7:1 [Table 1].

At the time of admission, patients in both the groups suffered similar scale of pain and agony. The VAS and ODI did not show significant difference in the pain and disability in both group of patients [Table 2].

There is a significant improvement in the visual analogue score and Oswestry disability index in patients treated by surgical procedure compared to patients who are treated on conservative basis. ($p<0.05$) There was little evidence of a difference in quality of life between groups throughout the study; however the SF-36 score had significant difference at 6 month post-surgery. ($p<0.05$) [Table 3].

Discussion

We found in present study that the surgical treatment, when compared to conservative treatment reduced the severity of sciatica symptoms and pain. It also improved the quality of life of patients with the lumbar disc herniation in the short term and long term. Quick Pain reduction was seen in the patients who received surgical treatment but the difference between the groups was no longer present after 3 months of both treatment modalities.

Patients in surgical group reported less physical impairments at the 6 month and 2 years of follow-up. Faster improvement in pain symptoms in patients treated with surgical treatment is a common finding in comparison with patients treated conservatively with lumbar disc

		Group A (n=30)	Group B (n=30)	p-value
Age in years		36.7 ± 5.8	37.01 ± 5.56	0.821
Gender	Male	18	20	
	Female	12	10	
Group A: surgically treated patients; Group B: Non-surgical (conservative) treated patients, p-value <.05 considered statistically significant.				

Table 1: Demographic details of the patients

		Surgical Mean ± SD	Conservative Mean ± SD	p-value
Visual analog scale for pain (VAS)		7.23 ± 0.77	7.20 ± 0.88	0.476
Oswestry Disability Index (ODI)		29.77 ± 3.12	29.93 ± 3.22	0.866
Short Form 36	Physical	28.65 ± 1.62	28.7 ± 1.95	.323
	Mental	52.0 ± 5.0	50.0 ± 1.5	<.001*
p-value<.05 considered statistically significant.				

Table 2: Baseline characteristics of patients

	Surgical Mean ± SD	Conservative Mean ± SD	p-value
VAS			
6 month	2.73 ± 0.6	2.8 ± 0.71	.369
2 years	1.77 ± 0.9	2.1 ± 0.935	.03*
ODI			
6 month	3.03 ± 0.9	2.8 ± 0.66	.05*
2 years	1.93 ± 1.11	2.19 ± 1.0	.02*
SF-36 Physical function			
6 month	34.0 ± 2	38.4 ± 2.05	.895
2 years	42.5 ± 1.25	44.0 ± 2.0	0.01*
SF-36 Mental Function			
6 month	49.0 ± 1.0	46.4 ± 1.95	.005*
2 years	47.5 ± 1.5	46.65 ± 1.17	0.186
Visual Analog Scale for pain (VAS); Oswestry Disability Index (ODI); Short Form 36 (SF-36). p-value <0.05 considered statistically significant.			

Table 3: Patient characteristics in all follow-up assessments at 6 month and 2 years

herniation. Previous studies also observed that back ache was reduced quickly with surgical treatment.[13,18] Nonetheless, results concerning neurogenic symptoms, physical function and quality of life are not recorded in other observational studies as reliably. In line with other observational studies, short-and long-term effects of surgical treatment have been observed in these outcomes are beneficial.[18]

There was a significant improvement in the VAS and ODI in patients treated with surgical compared to the patient treated conservatively [Table 3]. These findings are in relation with previous studies conducted. However, we did not see much difference in the quality of life in the patients at the follow-up. But, patients treated with surgical procedure showed a better score in physical and mental status on SF-36 questionnaire.[19]

Conclusion

Although patients were more symptomatic at the entry, there was substantial overlapping of symptoms between the surgically treated patients and conservatively treated patient. Surgically treated patients with sciatica reported substantially greater improvement at the 2-year follow. This study concluded that patients with lumbar stenosis without spondylolisthesis benefits from surgery with a reduction in pain reported in the lower limbs (VAS leg with $p<0.05$) and improved function (Oswestry with $p<0.05$); however, it didnot show any much significant change in quality of life according to the SF-36 scale.

Conflict of Interest: None
Source(s) of support: None

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