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ORIGINAL ARTICLE

Outcome of Limping Radicular Pain Due to Lumber Disc Herniation Treated with Lateral Recess Decompression without Discectomy: A Longitudinal Study

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ABSTRACT

Aim: To assess the outcome of limping radicular pain due to lumber disc herniation treated with lateral recess compression without discectomy

Study design: A longitudinal study

Place and Duration: This study was conducted at People's University of Medical and Health Sciences for Women Nawabshah Pakistan from January 2020 to January 2021.

Methodology: A total of 65 patients were selected for standalone lateral access decompression with a tube shaped retractors. All patients selected were having limping radicular pain. Study investigated the disc consistency and the existence of sequestrated pieces. VAS and ODI scores methods were used to examine the condition. Age, gender, bodyweight, duration of illness, profession, usage of painkillers, preoperative VAS score, and Pain and disability Index version (ODI) score were all collected from the participants

Results: The stand alone lateral access decompression was carried out from 60 patients out of 65. The 5 patients that were endured were in need of sequestrated disc removal. The average age was 53 years (40-68years), the ratio of male and female was 1.41:1.21, and the average follow-up period was 4 years (3.1–5.7 years). Pre-surgical and post-surgical scores as well as the ODI scores were observed. Overall, 93 percent of patients were improved by the surgery.

Conclusion: For the patients that are having limping radical pain, decompression without the surgery of discectomy turns out to be medically beneficial for them. It can be performed without spinal cord or nerve root manipulation and mobilization and intervertebral disc extraction, that results in decrease chance of postoperative neurodefecit, spinal nerves injuries and discitis. Which enhances postoperative rapid recovery.

Keywords: radical pain, limping. Discectomy, lateral recess compression

INTRODUCTION

There is an inflection of radical pain and positive root tension indications dominant in patients that are infected with disc herniation. [1] The surgery of discectomy takes places where conventional treatments fail. [2-4] Nevertheless, there are also a few situations where patients face limping radical pain or extreme leg pain with a negative SLR and later the MRI report discloses disc herniation. These are the situations where neurogenic limping is present with the lateral recess is a subordinate to the existence of disc herniation. [5] These patients do not show demonstrable root tension signals. Radicular symptoms corresponding to the specific dermatome involved would result from dynamic compression of the lateral recess during walking and truncal extension. [5, 6] There is a lack of administration in this set of patients. In such cases, some writers suggest lateral recess decompression along with the surgery of discectomy [7-9] Future studies concentrating on the results of stand-alone decompression without the surgery of discectomy in such patients have not been undertaken to the researchers knowledge.

The goal of this study was to look at and report on the health outcomes of stand-alone lateral recess decompression in patients with lumbar disc herniation who have limping radiculopathy.

METHODOLOGY

After implementing the set of criteria, a total of 65 patients with symptomatic radicular pain as their primary issue were registered. Permission was taken from the ethical review committee of the institute. Following participants were included in this study: (a) Cases with radicular pain that are accompanied by radiographic evidence of specific medial invasion. (b) Cases in which the conservative trial failed for a period of at least three months, immobilization, analgesics physiotherapy, and occipital nerve or spinal blocks are used in the conventional trial. (c) Cases with lateral recess narrowing due to disc herniation on pretreatment magnetic resonance image. (d) Mono surgery candidates, i.e., disc herniation and lateral recess narrowing at the same level with no additional levels implicated. (e) Cases of limping radicular pain or pain that worsens with abdominal extension (standing lying, side lying) and improves with muscle contraction (sitting, stopping forward) and (f) Cases in which the SLR test was conducted to evaluate the existence of root tension, but the results were negative. A positive SLR was defined as the patient's sciatica pain returning between 30 degrees and 70 degrees of passive leg raise along the medial pattern of engagement.

Following participants were excluded from the study: (a) Instability was assessed by on standing dynamic flexion and extension radiographs. On radiographs, this was described as more than 3 mm of lateral translation or more than 10 degree of angulation. (b) Back discomfort that is unpleasant or irritating. (c) Patients with lumbar canal narrowing on many levels or adjacent level disc herniations. These were situations that required many stages of decompression or discectomy. (d) Cases in which the straight leg raising was positive and (e) Cases that worsens with truncal abduction (sitting, slumping forward). This means that patients who experienced discomfort in both flexion and extension.

Age, gender, bodyweight, duration of illness, profession, usage of painkillers, preoperative VAS score, and Pain and disability Index version (ODI) score were all collected from the participants. On MRI, the percentage area of the whole canal covered by the disc herniation (including upper lateral canals) was determined and characterized as 1/ 3rd canal utilization, 1/3rd to 2/3rd canal accommodation, and >2/3rd canal availability. On MRI, disc herniation was defined as a regional displacement of specimen beyond the boundaries of vertebral body space (half of disc circumference). It was considered focal if it took up less than 15 percent of the disc diameter. If it took up 15 percent to 50

percent of the disc circumference, it was considered broad based. The pattern of the herniation determined whether it was a projection or an ejection. If the largest gap between margins of misplaced disc material in any dimension was shorter than the gap between margins of the base of herniation in the same dimension, disc herniation was designated as projection. If the ejection was higher than the base in at least one dimension or the misplaced disc material was not in continuous with the disc space, it was called ejection. One surgeon performed on all of the patients. The decompressions were done with the use of a cylindrical retractor device and an operational magnifier. Three critical factors were examined surgically. The flexibility of the nerve root, the smoothness of the disc herniation, and the existence of sequestrated disc pieces are all assessed. A Penfield dissector was used to evaluate nerve root flexibility and disc uniformity. Patients with firm disc constancy and no sequestrated pieces were given the green light to proceed with the independent lateral recess compression approach. Preoperative blood loss, operation time, postpartum problems, and hospital stay time were all recorded. All patients were mobilized as quickly as possible (typically within 24 hours) and discharged on the following surgical day. At one week, six weeks, six months, and one year after surgery, patients were examined again. Patients were then updated every year following that. The VAS score was used to assess leg pain, as well as the use of painkillers sometimes during surgery. The ODI score was used to assess back pain and disability explicitly. Patients with a follow-up of less than three years were omitted.

Patient satisfaction is characterized using Macnab criteria12: (1) Outstanding (no pain, no restriction of activity), (2) Moderate (odd random back or leg discomfort severe enough to prevent you from working), (3) Acceptable (increased functional capacity but limited by periodic pain severe enough to prevent curtain work) and (4) Poor (no or inadequate recovery to allow increased activity; more operational procedures are required).

Only the first ten cases had preoperative Computed tomography (CT) scans and magnetic resonance imaging as a preliminary study to confirm the appropriateness of compression and the existence of disc calcification. SPSS version 23 was used to analyses the data.

RESULTS

A total of 65 patients who met the eligibility criteria were scheduled for lateral recess compression without the surgery of discectomy as a stand-alone treatment. In 60 of the 65 patients, we were competent to accomplish stand-alone lateral recess decompression effectively. The five remaining cases had sequestered discs, which needed fragmentectomy in order to obtain appropriate compression. Three participants were lost to follow-up, leaving a total of 62 cases for review at the end of the experimental period. The average age of participants was 53 years, with 28 males and 23 females, with a ratio of 1.41:1.21. Just before surgery, the average disease duration was 122 months. Seven of the patients had previously had lumbar spine surgery. At the upper level, they'd all had a discectomy. Disc herniations were limited to the rate of 2.0 lumbar levels in our study, with 24 patients having Lumbar spinal disc herniation and 29 patients having L4-L6 disc herniation. There were 29 cases with broad based hernia, with 19 having projection and 10 having ejection. There were ten individuals with unilateral herniation, 5 with projection and five with ejection. All of the patients had a firm disc uniformity. Hard disc constancy was also present in 5 patients with sequestrated discs who required fragmentectomy. A computed tomography scan indicated calcification disc or disc susceptible clusters in the first 9 patients. At the last follow-up, the mean VAS scores had improved dramatically from 9.39 plus minus 0.83 to 3.5 plus minus 0.44. At the last follow-up, average ODI showed improvement from 42.6 to 19.7. With a probability value of 0.001, improvements in VAS and ODI scores were clinically significant. Six patients had neurological deficits, three of whom improved following surgery. No progress was seen in the sixth patient who arrived late. The average postoperative blood loss was 50 milliliters (range 40–100 milliliters), and the operation took 70 minutes (range 40–115 mins). Patients typically came back to work after 11 days (range 7–15 days) after a median hospital stay of 2-3 days (range 1–4 days). The average time of follow-ups was 3.9 years (range 2.9 –5.2 years).

Table 1: Characteristics of the study participants

Data	Claudicant Radiculopathy
Age	53
Male gender	28
Body weight	30
Profession	
1.Sedentary	15
2.Light work	29
3.Heavy manual work	9
Duration of symptoms	13
Patients with previous surgery	4
Consumption of painkillers	
1.None	4
2.Intermittent	20
3.Regular	37
4.Patients with neurological deficit	6
Level of engagement	
1.L5-S1	22
2.L4-L6	29
Type of herniation	
1.Broad based	30
2.Projection	19
3.Ejection	12
4.Focal	21
5.Protrusion	14
6.Extrusion	17
7.Left side	29
Patients with comorbidities	
1.Diabetes	4
2.Smoking	2
3.Alcohol consumption	11
4.Osteoporosis	19
5.Hypertension	21
6.Anti-depressants	2
Canal compromise	
1.<1/3rd	27
2.1/3rd-2/3rd	18
3.>2/3rd	5
Conservative treatment	
1.Physical treatment and medicines	50
2.Steroid intake	11
3.Nerve blocks	14

Table 2: Pre-surgery data of study participants

Intraoperative blood loss	50 milliliters
Duration of surgery	70 mins
Patients with CSF leak	3
Patients with hard disc consistency	50
Patients with sequestrated disc fragments	5
Patients with neurological complications	0
Hospital stay	2-3 days
Return to work	11 days
Mean follow-up	3.9 years

Objectively, 47 patients required painkillers prior to surgery, with ten of them taking steroid medicine. On long-term follow-up after stand-alone decompression, two patients continued to take painkillers in a significant proportion. In these four patients, a postoperative magnetic resonance imaging was performed at a later visit, and sufficient decompression was found. CSF leaks were observed in three individuals, and they were repaired with fibrin glue. The disc pieces comprised more than two-thirds of the canal in both of them. Recruitment was postponed for a day, and they both recovered without incident. There were no other vascular

or post-operative complications. With an average follow-up of 3 years, 47 (73 per cent) patients were satisfied with the procedure. We had ninety percent of patients with significant results at the conclusion of their first year of follow-up, omitting four patients who were abandoned to follow-up. At the conclusion of their fourth year, it had dropped to 84 percent. Results were good in 89 percent of individuals with much more than six years of follow-up. During the research period, unfortunately, none of our patients chose to have reoperation.

Table 3: Medical Results of patients

VAS	Average Standard deviation	P-value
Pre operation	8.29	<0.001
Post operation	3.29	
6 months	1.16	
1 year	1.92	
Final follow-up	3.50	
ODI	Average Standard deviation	<0.001
Pre operation	45.2	
Post operation	20	
6 months	19.1	
1 year	17.32	
Final follow-up	19.1	
Painkillers	Percentage of patients (%)	<0.001
Pre operation	93	
Post operation	32.7	
6 months	14.9	
1 year	2.1	
Final follow-up	5.9	
Results	Percentage of patients (%)	
Excellent	90	
Good	3.2	
Moderate	2.9	
Bad	4.1	

DISCUSSION

Lumbar disc herniations appear in a variety of ways. [10] Pharmacological, physical, and immunological diseases all have an impact on these clinical symptoms. Aggravation of pain on coughing straining, stooping forward, and a positive straight leg raising test are all frequently present at younger age. But, as people become older, the appearance of disc herniation begins to resemble lateral recess narrowing. These instances manifest with limping radicular pain, dominant pain on truncal straitening, and negative root tension signals in completely opposite ways. [11] The goal of our research was to observe how patients with stand-alone lateral recess insufficiency improve. As a result, patients with disc herniation who also had indications of lateral recess narrowing have been included in the study. The average age of study participants in our study was 53 years. In each of these patients, the length of clinical features were well distinguished from cases of acute disc herniation and of lateral recess narrowing caused by other factors.

When the nerve root's movement is limited, either by mechanical pressure by disc pieces or by adherence between disc material and nerve root, root tension indicators tend to be positive. We employed a positive SLR testing as a root tension marker to rule out patients with disc-related discomfort. For disc herniation, SLR's detection accuracy ranges from 1.15 and 1.78 to 1.98 and 1.74, correspondingly. The SLR test was adopted for this research since it has been carefully researched by numerous writers. The result of the SLR test, according to Bankart [12], Holmes and Sworn [13], Thelander et al., and Edgar and Park [14], is not connected to the extent of the herniation, but to a convoluted procedure dependent on chemical irritation rather than direct compression. As a result, discectomy/sequestrectomy is the best therapeutic alternative for patients who show evidence of positive root tension. Nonetheless, the patients in our research either felt claudicant discomfort as a result of dynamic pressure during walking or lateral recess narrowing as a result of extension. [15, 16] The lateral recess narrowing, not the biochemical alterations of a ruptured disc, was the key pathology-causing symptom. These individuals were most likely in the Kikardly-Willis stabilization phase, and the researchers believed that solitary compression would generate positive influences. This was amply demonstrated in our research.

This shift in signs is thought to be caused by a decrease in disc water and proteoglycan content, changes in collagen production and matrix protein content, disc calcification, and a reduction in the area of the lateral recess as people get older. Radiographic intradiscal mineralization was found to be associated with degenerative discs in various studies. Skeletal fluorosis is aided by the stiffness and thrombosis that occurs after a herniated pulp chamber. During the acute period of disc herniation, individuals may be symptomatic or respond to conservative treatment. The prevalence rate of disc calcification (microscopic) may range from 13 per cent to 61 percent, which is consistent with our findings of hard disc uniformity. The fact that under certain circumstances, a needless discectomy could be prevented is a significant achievement. [17, 18] Without the use of sharp objects and severe retraction of neural systems, discectomy is difficult in these situations with hard and calcified disc uniformity. Dural rips and/or neurological problems are possible outcomes of these techniques. As shown in our research, proper compression by itself is linked to a lower rate of complications while preserving favorable clinical results. In 60 of the 65 instances, we seem to have been able to complete our stand-alone lateral recess compression technique successfully. It is generally understood that discectomy might result in progressive degeneration or associated consequences. Patients who have lumbar discectomy face persistent low back pain and repeated herniation since the injured disc remains to bear weight for the remainder of the patient's life. In as many as 74 percent of patients, aggressive discectomy is linked to faster disc height reduction and correlates to lengthy back and leg pain. Re-herniation is linked to larger annular defects and less disc withdrawal. During the first year after index surgery, recurrent disc herniation is common. As a result, the average follow-up in our research was sufficient to record the majority of recurrences related to re-herniation.

For lateral recess narrowing, traditional decompression entails a broad laminectomy and partial facet resection. Turner et al. [19] and Katz et al. [20] found a success rate of only 55 percent to 64 percent with such a technique. The main concerns were reoperation due to spinal fragility and reperfusion.

With the introduction of the port-hole procedure, however, success rates of 78 percent to 100 percent have been observed. The rate of reoperation has decreased from 33.5 percent to 22 percent. According to Wong et al., treatment success rates and the frequency of postoperatively back discomfort have decreased even further with micro endoscopic operations using cylindrical retractors. Several authors speculated that the positive effects of decompression would not last for longer period. Even after more than six years of follow-up, the majority of patients in our study had maintained the clinical advantages gained after index surgery. Due to the instability or repeated disc protrusion, none of our patients required revision surgery. Gender, Weight, or the presence of comorbid diseases had no effect on the outcomes. Even in subjects with elevated sets of needs, we were able to get acceptable results if they were told to avoid lifting weights higher than 11 lbs. for 6 to 12 months. The essence of this kind of treatment is accurate understanding of physiology, positioning with a telescope, and comprehension of the significance of numerous downstream factors in spine segments mobility and stability. The study's less invasive procedure resulted in less perioperative blood loss, a reduction of postpartum back discomfort, a shorter hospital stay, and an earlier return to work.

There were a few limitations in our research. Due to the small number of patients included in this study, we were unable to make a comparison to investigate the impact of different decompression procedures on this subset of patients. Furthermore, due to extensive overlap in clinical manifestations, it

may not be possible to distinguish all individuals into either claudicant type of radicular pain or radicular pain attributable to disc herniation in a medical setting. To confirm the findings of this study, more prospective study control trials are likely to be necessary.

CONCLUSION

The form of radicular leg pain plays an important role in evaluating whether such a lumbar disc herniation requires discectomy in the majority of patients. For the significant proportion of patients with claudicated radicular pain the magnetic resonance image showed evidence of lateral recess stenosis related to unilateral disc herniation, stand-alone lateral recess decompression without discectomy is clinically beneficial. Patients with sequestrated disc herniation would be treated with alternative therapy. It is less invasive simple and well targeted therapy that has positive and immediate effect on postoperative improvement of neuro-deficit and rapid pain relief, decrease hospital stay.

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