

ORIGINAL RESEARCH

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Evaluation of pain status and quality of life in patients with lumbar disc hernia who underwent microdiscectomy**Abdurrahman Cetin¹, Mehmet Tahir Gokdemir²**¹ Health Sciences University, Gazi Yasargil research and training Hospital, Brain and Neurosurgery, Diyarbakir, Turkey² Health Sciences University, Gazi Yasargil research and training Hospital, Emergency Department, Diyarbakir, Turkey

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Abstract

The objective of this study was to evaluate the emotional state, pain status, and quality of life in patients with lumbar disc herniation using preoperative Oswestry Disability Index (ODI), Visual Analog Scale (VAS), and 1- and 3-months postoperative VAS scores. Between December 2017 and March 2018, 49 patients with lumbar disc herniation, who were admitted to our neurosurgery department, were enrolled in this retrospective study. According to the ODI questionnaire, pre- and postmicrodiscectomy analysis revealed a statistically significant improvement in all the parameters (for all parameters, $p < 0.001$). VAS scores of the patients showed a significant gradual decrease in the severity of pain at 1 and 3 months following the operation ($p < 0.001$). It was observed that lower back pain and quality of life in patients improved following microdiscectomy surgery. Microdiscectomy surgery is still an important option in lumbar disc herniation treatment.

Keywords: Lumbar disc herniation, visual analog scale (VAS), microdiscectomy**Introduction**

Lumbar disc herniation is one of the primary causes of chronic lower back pain. It is a pathological process rather than a medical condition and occurs mostly at the lower lumbar spine, particularly at the L4-L5 and L5-S1 levels. Lower lumbar vertebrae, which carry a large amount of body weight, frequently degenerate, eventually leading to a breakdown of fibrous cartilage material (annulus fibrosus) and herniated nucleus pulposus. The most common symptom of patients with disc herniation is blunt and severe pain that spreads to the lower extremities from time to time. Symptoms occur depending on the anatomic location where a physiopathologically herniated nucleus pulposus creates compression. Median-level compression causes lower back pain, and lateral-level compression causes leg pain [1,2].

There are several surgical approaches for lumbar disc herniation, such as median-level, lateral, paraspinal, and intertransverse. Surgical procedures used for these approaches include open surgery, microsurgery with surgical microscopes, endoscopic surgery via a thin tubular channel, and percutaneous surgery [3]. In addition, the choice of surgical procedure mainly depends on the infrastructure of the hospital and the experience and preference of the surgeon.

The objective of this study was to evaluate the emotional state, pain status, and quality of life in patients with lumbar disc herniation using preoperative Oswestry Disability Index (ODI), Visual Analog Scale (VAS), and 1- and 3-months postoperative VAS scores.

Material and Methods

The study designed as a questionnaire study. Sixty-five patients underwent microdiscectomy with a diagnosis of lumbar disc herniation were admitted to the neurosurgery department of our Hospital, between December 2017 and March 2018. Sixteen of these 65 patients were excluded due to lack of data, and 49 patients were included in the study. Lumbar magnetic resonance imaging (MRI) was first performed to confirm the diagnosis of lumbar disc herniation in these patients who were referred to the neurosurgery department due to lumbar pain. Electromyography (EMG) and spinal MRI myelography were performed if required. The surgical intervention decision was made on the basis of the clinical examination, MRI, spinal MRI myelography, and EMG results. Lumbar microdiscectomy was performed with patients under spinal anesthesia or general anesthesia. Following dermis and subcutaneous tissue, fascia was incised. The muscles were incised by blunt dissection. A Taylor retractor was placed at the disc level. Soft tissues were cleaned with a rongeur. After placing a microscope into the surgical area, hemi-partial laminectomy was performed. Following hemostasis, ligamentum flavum was

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excised. The root medial was excluded with a root retractor. Discectomy was performed using disc forceps. Foraminotomy was performed if required. The surgical area was cleaned with an isotonic solution, and hemostasis was achieved. All the patients who underwent surgery were administered intramuscular analgesics for 2 days following the operation and oral nonsteroidal anti-inflammatory drugs for a week.

Preoperative and postoperative 1-month values according to the were compared. In addition, VAS pain and quality of life scores were recorded in all patients before and 1 and 3 months after the operation. Age, gender, and other sociodemographic data as well as pain and quality of life data were recorded. The data were recorded separately as pre- and postmicrodiscectomy. As per the exclusion criteria, patients aged ≤ 18 years, patients with a bleeding diathesis, patients with chronic pain for other reasons, patients with malignancy, and patients aged ≥ 70 years were excluded from the study. The ethical committee approval for this study was received from our Hospital.

For the statistical calculations, data were uploaded to SPSS software v.16.0 (SPSS, Chicago, Illinois, United States), and statistical analysis was performed. A Shapiro-Wilks test was used to confirm the normality of the distribution in each group. Since the distributions were normal, statistics for continuous variables, including the mean and standard deviation (SD), were calculated. While a descriptive statistical analysis was performed as a number and percent for the figures, Friedman analysis was used for the continuous variables for multiple comparisons. They were considered significant for $p < 0.05$ values within 95% confidence intervals.

Results

All patients underwent microdiscectomy operation. Of 49 patients who were enrolled in the study, 26 (53.1%) were women, 23 (46.9%) were men, and mean age was 47.4 ± 12.8 years. Herniated disc was located at L4-L5 in 31 patients (63.3%), at L3-L4 in 10 (20.4%), and at L5-S1 level in 8 (16.3%) (Table 1).

Table 1. Distribution of patients by age, gender, and level of disc herniation

Gender	No	%
Male	23	46.9
Female	26	53.1
Level of disc herniation		
L3-L4	10	20.4
L4-L5	31	63.3
L5-S1	8	16.3

As seen in Table 2, a preoperative and 1 month postoperative ODI Questionnaire was used in all patients. In the comparison of pre- and postoperative values, pre- and postoperative analysis revealed that all parameters statistically significantly improved in patients who underwent microdiscectomy (for all the parameters, $p < 0.001$).

As seen in Table 3, the preoperative VAS scores and 1- and 3-months postoperative VAS scores were compared. The mean preoperative VAS score was 7.8 ± 1.0 , the mean 1-months postoperative score

was 2.5 ± 1.0 , and the mean 3-months postoperative score was 2.1 ± 0.7 . VAS scores of the patients showed a significant gradual decrease in the postoperative severity of pain ($p < 0.001$).

Table 2. Comparison of pre- and postoperative values according to the Oswestry Disability Index

Parameters	Preoperative	Postoperative	p
Severity of pain	4.2 ± 0.9	1.5 ± 0.5	<0.001
Personal Care	3.4 ± 1.3	1.6 ± 0.6	<0.001
Lifting Load	3.8 ± 1.2	1.8 ± 0.7	<0.001
Walking	4.1 ± 1.0	1.8 ± 0.7	<0.001
Sitting	4.7 ± 1.0	1.3 ± 0.4	<0.001
Standing	4.3 ± 1.2	2.7 ± 1.2	<0.001
Sleeping	3.6 ± 1.1	1.6 ± 0.5	<0.001
Social life status	3.8 ± 1.4	2.0 ± 0.8	<0.001
Traveling	3.8 ± 1.4	2.2 ± 0.8	<0.001
Degree of change in pain	4.8 ± 1.0	1.9 ± 1.1	<0.001

*Friedman's analysis

Table 3. Comparison of preoperative and 3- and 6-months postoperative VAS scores of the patients who underwent microdiscectomy

Time of VAS score	Mean $\pm$ SD	P
Preoperative VAS	7.8 ± 1.0	<0.001
1.Months postoperative VAS	2.5 ± 1.0	
3.Months postoperative VAS	2.1 ± 0.7	

*Friedman's analysis

Discussion

In the present study, significant improvements were observed following microdiscectomy surgery in severity of pain, sleeping, physical activities, and social life according to ODI scores. In addition, the 1- and 3-months postoperative VAS scores showed a significant gradual decrease in severity of pain compared with the preoperative scores.

Conventional conservative treatments, such as physiotherapy, epidural steroid injections, and daily life activity modifications, are effective to a certain degree in the management of pain associated with lumbar disc herniation. However, surgical intervention is inevitable for some patients. In patients with lumbar disc herniation who fail conservative treatment, lumbar microdiscectomy is recommended for the relief of nerve compression, radicular symptoms, and neurological deficits. The surgical success rate for radiculopathy caused by lumbar disc herniation is approximately 80%–90% [4]. The success of the procedure depends on the experience of the operating surgeon and health personnel as well as several preoperative factors. Clinical results following lumbar microdiscectomy are generally excellent, and 76.2% of such patients return to their jobs within a year [5]. The rate of patients with full symptomatic relief and full recovery following microdiscectomy is a compelling clinical issue that has not yet been sufficiently addressed in the literature [6].

Lumbar microdiscectomy is the preferred treatment for patients with radiculopathy in symptomatic lumbar disc herniation who fail conservative treatment and require surgical intervention. This procedure has become more popular thanks to encouraging postoperative results. Several studies have demonstrated that

lumbar microdiscectomy is an effective procedure with a high level of patient satisfaction in terms of pain relief and recovery of functions [7,8]. Statistically significant postlumbar microdiscectomy results were published by Asch et al. in 2002. This study showed that 80% of 212 patients experienced pain relief in the leg and lumbar region [9]. In another study that included 28 patients with lumbar disc herniation, half of the patients were operated with microdiscectomy, and the other half were operated with discectomy; no difference was observed in the patient follow-ups. In addition, it was reported that the patients in the microendoscopic group used more analgesic compared with those in the microdiscectomy group. The main problem in open surgical procedures is the surgical trauma in the posterior paravertebral muscles [10]. This trauma can be minimized by microdiscectomy. In our study, patients were operated with the microdiscectomy method, and no complication was reported in the 1-month follow-up. Moreover, significant improvements were observed in the quality of life as well as severity of pain, sleeping, physical activities, and social life status following microdiscectomy surgery according to ODI scores. A significant gradual decrease was also observed in the severity of pain according to VAS scores in 1 and 3 months following the operation.

Pain management following lumbar disc herniation procedures is important for patients' quality of life. For this reason, usually opioids are used [11,12]. Recently, the use of nonsteroidal anti-inflammatory analgesics has become popular [13,14]. In the present study, all the patients were administered nonsteroidal anti-inflammatory drugs for 1 week following the operation. Bleeding complications associated with NSAIDs were noted; however, no bleeding was reported during the 1-month follow-up.

The complication rate following microdiscectomy surgery is significantly decreased, and the incision is minimized. Significant improvements occur in daily life functions during the postoperative period, such as pain reduction, a regular sleep schedule, and improvement in physical activities [15]. In our study, significant improvements were observed in social and physical activities, including a regular sleep schedule.

There were undoubtedly several restrictive conditions in this study. It was a single-center, and the number of patients was relatively limited. Another restrictive condition was that the patient follow-up records for the operations were limited.

Conclusion

In conclusion, herniated disc mostly was located at L4-L5 in our findings. The lower back pain status and quality of life in patients were improved following microdiscectomy surgery. VAS scores of the patients showed a gradual decrease in the postoperative severity of pain. Lumbar pain is a major cause for referral to emergency wards and outpatient clinics. One of the most important causes of lumbar pain is lumbar disc herniation. Microdiscectomy surgery is still an important option in lumbar disc herniation treatment.

Competing interests

The authors declare that they have no competing interest

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

Ethical approval

The ethical committee approval for this study was received from our Hospital.

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