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Evaluation of patients operatively treated with a diagnosis of lumbar disc hernia: An epidemiological investigation

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ABSTRACT

Lower back and leg pain is a common condition in the community which leads to loss of work and restricts daily life activities. About 2-3% of all painful lower back syndromes are caused by lumbar disc herniation (LDH). Surgery is performed in patients with sensory and motor deficits and the patients which are not responding to physical and medical treatment. In this study, we retrospectively evaluated the LDH patients that were operatively treated in our clinic through the review of the literature and the study was aimed to provide contribution to epidemiological studies.

The retrospective study included 190 patients who were operatively treated between January 2013 and December 2015. Age, gender, level of herniation, neurological examination findings, presence of trauma, length of hospital stay, profession, recurrence, and surgical outcome were evaluated in all patients.

The 190 patients included 108 (56.8%) males and 82 (43.2%) females with a mean age of 45 years. Mean length of hospital stay was 1.8 days. The level of herniation was L4-5 (51.6%), L5-S1 (32.1%) with a rate of 83.7%. Preoperative foot drop was found in 2.1% of the patients. Of these, 50% of them were improved and 50% of them sustained foot drop following the surgery.

Lumbar disc herniation is one of the most common spine surgeries performed. Appropriate surgical procedure with an accurate diagnosis leads to good success rates and high patient satisfaction. Following the surgery, 122 patients were graded as "perfect", 50 patients as "good", 15 patients as "moderate", and 3 patients as "poor". These findings were consistent with the findings of the literature.

Key Words: Lumbar disc hernia, epidemiologia, surgical

Introduction

Low back pain and sciatic nerve involvement were first defined by Hippocrates (B.C. 460–379), known as the Father of Medicine, in his book "The Body of Hippocrates" (1,2).

For centuries, several treatment methods have been used for treating sciatica, such as blood transfusion, rubbing the area using hot water and oil relieving the pain by push and pull techniques, and plastering. The first anatomical definition of intervertebral disc was made by Vesalius in 1555. Laseque was the first to define the relationship between low back pain and sciatica in 1864 (3,4,5). In 1977, Yaşargil added a new dimension to lumbar disc surgery by using microscope in lumbar disc surgery. Today, disc surgery is conducted under the microscope in several parts of the world.

Examination findings that are likely to be observed include pain striking the low back and leg, loss of motor power compatible with the dermatome of compressed nerve root, hypoesthesia, and urinary and fecal incontinences that can appear as sphincter defects in severe cases. In cases where disc herniation is diagnosed as a result of the investigations requested from the patients with these findings, surgery must be performed if the patients do not respond to medical and physical treatment.

Material and methods

In this study, a retrospective observation was made on 221 patients who had undergone lumbar disc herniation operation between January 2013 and December 2015. X-ray and lumbar MRI scans of the patients were obtained. Myelography that is not a routine in daily practice was not performed for the patients. Electroneuromyography (ENMG) was performed in five patients to confirm the diagnosis as the clinical findings were not

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compatible with the lesion level. The study did not include patients with lumbar spinal stenosis along with lumbar disc herniation and patients in whom stabilization was performed. The operated patients were evaluated by considering criteria, such as their ages, trauma histories, existence of relapse, preoperative and postoperative findings, disc levels, and complications. If the patient was painless, it was coded as *perfect*. If the patient was almost pain neveri it was coded as *Good*. If the patient's pain was near-half reduction, it was coded as *Medium*. If the Patient's pain was the same or worse, it was coded as Bad.

The patients were classified into three groups according to their ages: first group, 10-29 years; second group, 30-49 years; and third group, 50-70 years. Discectomy was performed in all the cases under the microscope.

Statistical analysis: Descriptive statistics for continuous variables were expressed as mean, standard deviation, and minimum and maximum values, while they were expressed as numbers and percentages for categorical variables. Chi-square test was conducted to determine the relationship between the categorical variables. The statistical significance level in the calculation was taken as 5%. SPSS (ver.20) was used for statistical calculation program.

Results

A total of 190 lumbar disc herniation operations were performed between January 2013 and December 2015. Among them, 108 patients (56.8%) were men and 82 (43.2%) were women. Their ages varied from 16 to 82 years, with an average age of 45 years. The relationship between gender and age is shown in Table 1.

Table 1. The relationship between gender and age group

Age groups	Female	Male	Total
10-29 age	7	14	21
30-49 age	40	55	95
50-90 age	35	39	74
Total	82	108	190

Discussion

Lumbar disc herniation is one of the causes of low back pain that is very common in the society (6). The increased frequency of this disease among the employed results in loss of workforce. Moreover, diagnosis and treatment expenses impose an economic burden (7-8). Lumbar disc herniation is frequently seen in our country where industrialization is underdeveloped as workforce is based on physical labor (8). Among the patients substantially treated through medical and physical treatment, 2%-8% of them undergo surgery.

This disease generally affects people in their middle and advanced ages. One of the reasons for this is that disc degeneration occurs over the course of time; nucleus pulposus loses its hydration, and consequently, the process which ends up with nucleus herniation in younger people who are mechanically more dynamic begins (2). However, the disease may rarely occur in childeren as well. Strömqvist et al. (9) conducted a research where the relationship between lumbar disc herniation surgery and gender difference are studied. They observed that Throughout their study period of 10 years, the result outcomes of 74 children undergoing LDH operation were found to be better compared to those of the adults in terms of patient satisfaction and complications.

Trauma is one of the important risk factors for the occurrence of lumbar disc herniation. There are case series where the rate of trauma history was found to be almost 60%–70% (10). In our study, trauma history was found in two patients (1.1%), which is very low when compared with the literature.

The most common test used in neurological examination is straight leg raise test (Laseque test), which is used to study the pressure on the spinal nerve in disc herniation. Femoral nerve stretch test is used mostly in higher levels (L1–2, L2–3, L3–4) of disc herniation. Blaauw et al. (11) found that 83% of patients with LDH have a positive laseque test. In our study, this rate was found to be 77.5%, comparable with the literature (Table 2).

Sensory examination findings are also important in terms of diagnosing LDH, and a high rate of

Table 2. Neurological examination findings

Findings	Frequency	n(%)
Lasque (+)	124	(77.5%)
Motor deficits	28	(14.7%)
Sensory deficits	88	(46.3%)
Foot Drop	3	(1.5%)
Loss of reflex	13	(6.8%)
Cauda-Conus syndrome	5	(2.6%)

Tablo 3. Lumbar disc herniation regions

Region	Frequency	n(%)
L1-2	1	(0.5%)
L2-3	4	(2.1%)
L3-4	8	(4.2%)
L4-5	98	(51.6%)
L5-S1	61	(32.1%)
Multiple	18	(9.5%)
Total	190	(100)

Tablo 4. Lumbar discectomy surgery results

Results	Number	%
Perfect	122	64.2
Good	50	26.3
Medium	15	7.9
Poor	3	1.6

positivity has been reported in the literature (12). In our study, the rate of sensory impairment was found to be 46.6%. High rates of motor power loss can be seen in advanced cases. In our series, the rate of motor power loss was 14.7%. Loss of reflex is also a common and important neurological examination finding that was found in 13% of patients in our study, which is low when compared with the literature (13).

Cauda equina syndrome is the most accurate and important surgical indication finding in patients with LDH, and we observed that 2.6% of patients in our study had this syndrome.

Lumbar disc herniation is most frequently seen at the L4–5 and L5-S1 disc spaces due to spinal balance and the load imposed. Its rate of incidence declines at the L1–2, L2–3, and L3–4 disc spaces, which are identified as upper space disc herniations. In our study, this rate was observed to be 83.7% at L4–5 and L5–S1 disc spaces. The rate of incidence of upper space disc herniation was 6.8%, and multiple disc herniation was observed in 9.5% of patients (Table 3).

Among the definitions that are used to evaluate the clinical characteristics of the patients after the operation, "perfect" indicates that the present complaints have completely disappeared and the patient has returned to his/her daily activities. The "good" result indicates that the patient occasionally has mild pain although his/her complaints have disappeared. The "moderate" result indicates that the patient could perform only minor tasks. The "poor" result indicates that the complaints have not disappeared but increased (Table 4).

Radiological monitoring methods and neurological nerve stimulation tests are used for the diagnosis of LDH. Previously used BT and myelography are very rarely used today and have been replaced by MRG and ENMG, respectively. X-ray is one of the first-line investigations for definitive diagnosis of spondylolisthesis and fracture. MRG is a golden standard investigation as it clearly reveals the disc spaces, disc degeneration, nerve root, and the distinction of the dural sac (12).

Today, several methods are used in LDH surgery of which microsurgical discectomy is the most common method. From only removing the sequestrated and herniated disc fragments to evacuating the disc space, there is a broad spectrum of surgical evacuations. Other investigations include endoscopic discectomy, nucleoplasty, and use of cages for the evacuated disc space (10).

There are several complications that are likely to occur during or after the operation. Besides dural injuries, nerve root damages cause cerebrospinal fluid fistula and infections; major vessel injuries (inferior vena cava, iliac artery, and abdominal aorta), small bowel injuries, and ureter and bladder injuries that are not related to the nervous system are also observed, although rare (14, 15, 16).

In our study, cerebrospinal fluid fistula occurred in two patients (recovered through drainage) and superficial infection occurred in three patients (treated with antibiotics) and these patients didn't require surgical treatment.

Lumbar disc herniation is a disease that is frequently seen in the society. Patients generally get rid of their complaints through medical and physical treatment. Conservative treatment of LDH cases involves bed rest, use of analgesics and anti-inflammatory drugs, physical treatment, and limitation of physical activities. A bed rest of 1–2 weeks followed by the use of orthosis for a few weeks can be recommended to patients who experience pain during the acute phase of the disease (10).

Conclusion

The success rate is high in the operated patients, performed under the right criteria. Surgery is the most efficient and safe method in these patients. A successful surgery must cease the pain striking the leg. In cases with neurodeficit it is more frequently observed that the defect declines in the early period and disappears in the late period. The

findings on the 190 cases in our study were generally consistent with those reported in the literature.

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