

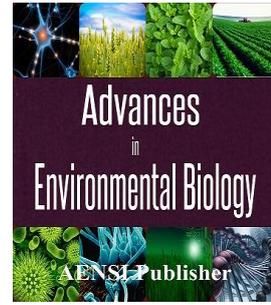


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Lumbar Disc Herniation

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ABSTRACT

Low back pain comes second among the reasons for seeing a doctor. Lumbar disc herniation is determined in 1-3% of all patients consulting a doctor for low back pain. Lumbar disc herniation (LDH) is a mechanical disorder characterized by the degeneration in disc structures that facilitate the movement between spinal discs and protect against strikes. Work activities including bending and twisting that are frequently used in daily life, inappropriate weight lifting, awkward static posture and psychological stress are the causal factors in development of LDH. The treatment of lumbar disc herniation is firstly the conservative treatment. Surgical treatment is considered as the last resort. 86 patients on whom epidural steroid injection was performed, applying for low back pain, diagnosed with lumbar disc herniation and not yielding a sufficient result with such medical practices as physiotherapy, corset etc. were included in our study (figure 1a,b,c,d,e). We achieved 62% success within 21 days in those patients. We ascertained increased pain in 16% of them in the first 5 days and severe headache lasting for approximately 10 days in 20% of them. All of our patients whose symptoms disappeared after the treatment were ensured to go back to their active life.

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INTRODUCTION

Disc material consists of a relatively harder outer sheath between two neurocentra and gel-like soft tissues inside. It acts like an absorber and distributes the loads of the body [1]. Discs between vertebrae in lumbar region are the ones with the widest surface of the spine and the task of these discs are to carry the load and to protect the spine. Force on the disc is closely related to the posture [2].

Ligaments stretch excessively and soften with joint capsules in individuals whose posture and lying positions are not normal and who don't do exercise. Load on spinal joints increase. Their natural posture degenerates [2].

As a result, if an excessive load occurs on lumbar vertebra (gaining excessive weight and lifting heavy things), and if other structures particularly lumbar and core muscles ensuring lumbar support weaken (absence of exercise) or if degeneration occurs in these discs because of structural and genetic reasons, disc herniation can happen [1]. Especially an increase in saddleback and cavitation of lower back cause articular surfaces to converge and to slide over each other. And this stretches the joint capsule and causes frequently seen pains in lower back [3].

If inner core protrudes due to weakening or tear of outer sheath of disc and starts to apply pressure on nerves, it is called "herniated disc" [1] (Lumbar disc herniation -LDH). In this sense, lumbar disc herniation (LDH) is a mechanical disorder characterized by the degeneration in disc structures that facilitate the movement between spinal discs and protect against strikes [4-6], 2-3% of all painful lower back syndromes are due to the lumbar disc herniation (Büyükkınacı, 2005). The lifetime prevalence of lower back pain is 80%, its annual incidence is 2% and the prevalence changes between 15-19% [6, 7]. As the disc herniation applies pressure on nerve root, it also causes pain on leg. Pain in femur and leg, weakness and numbness can occur depending on the level of pressure in nerves [1]. In short, natural course of disc herniation can be summarized under three stages, the first stage is degeneration; it starts with walking, cannot be prevented and ends with complete degeneration. The second stage is the course of disease. Disc inclines towards nerve components, the symptoms are lower back pain and sciatalgia [8].

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There are three possible mechanisms which cause disc resolution [9]. The first one is the theory of dehydration; it is the resolution based on the progressive dehydration and decrease of disc hernia [10]. The second one is inflammatory reaction and neovascularization. In this hypothesis, disc hernia is recognized as a foreign material in the spinal epidural region and inflammatory reaction is induced by the autoimmune system. This condition leads to the neovascularization of cartilage tissue together with the infiltration of inflammatory cells like macrophage, granulocyte and lymphocyte [11-13]. The third mechanism is the theory of retraction, disc hernia retracts backwards to the intervertebral distance. In theory, disc hernia must have a connection with the intervertebral distance [14]. Komori et al have proved that disc hernias can be mobile and downsizing can occur. Haro et al have put forth that phagocytosis frequently occurs because of macrophages in equestrium and subligamentary disc hernias [12]. Herni et al. have indicated that big ones downsize more than the small ones in protruded disc hernias and the reason is based on the fact that big disc hernias contain more water in patients aged less than 40 [13, 14].

Etiology:

Personal, physical and psychosocial risk factors play a role in the development of lumbar disc herniation [6]. Cumulative microtrauma is held responsible in the etiology of the disease and it is stated to be seen more frequently in those driving motor vehicles, not having the habit of doing sports and smoking [8, 15, 16].

Work activities that include frequently used bending and twisting movements, inappropriate weight lifting, awkward static posture and psychological stress are considered as the causal factors in development of LDH [17, 18]. Falling, wrong bending movement and traffic accidents are the other reasons [5]. Improper movements for body mechanics considerably increase the development of LDH and LDH dependent complications [4, 5]. Proper body mechanics ensure coordinated operation of muscles, joints, bones and nerves by coordinating with other systems [6].

Aging leads to disc degeneration and increases the risk for herniation. It is also stated that the mostly affected group is composed of the individuals aged between 30 and 50 due to the risks arising from occupational characteristics [4, 5]. The load increasing effect of obesity on spine is unquestionable. The studies conducted have also determined that obesity is a serious risk factor playing a role in LDH etiology by increasing the load on spine and preventing the proper body mechanics [19, 20, 6].

Clinical Symptoms and Findings:

Particularly lower back pain, leg pain, problems about strength and hypoesthesia [19], complaints about lower back and leg pain, change of senses, motor disturbances, autonomous and vegetative changes and nerve tension are observed in lumbar disc herniation. Lower back pain mostly reveals itself as the first symptom of the disease. It generally starts suddenly and gains continuity by intensifying from time to time [8, 21].

The pressure of motorfibrils in the nerve root causes weakness in the respective nerves and decrease in atrophy and tonus. Decreased sense of bladder is the earliest finding. Urinary urgency, pollakiuria and nocturia, being the irritative symptoms which include post-micturation increased residue are observed. Changes in body temperature, excessive tenderness on the skin, thrombophlebitis in legs, trophic edema, painful articular limitation of movement can be present. Cauda equina occurs with the overlapping of previously existing conditions such as spinal stenosis, tethered cord in L4-5 midline discs. Surgically intervened disc constitutes 1-2% of hernias. Unilateral or bilateral leg pain can be observed in lower back pain. Achilles reflex disappears. Saddle anesthesia is observed on bilateral buttocks, posterior region of femur and perineum [8].

Incidence:

Lumbar disc herniation is mostly observed in middle-aged people. While 70% of the cases are aged between 30-50, 10% is aged over 60 [8]. It is rarely seen in childhood [8, 22, 23]. Lumbar disc hernias generally occur in men with higher rates and this incidence changes between 65-80% [21].

Treatment:

Lumbar disc hernias can be treated with surgical and conservative methods [16]. The purpose of treatment in LDH is to take the pain under control, to increase functional activity, to reduce labor loss, to prevent injury and to ensure rehabilitation in chronic cases [24, 25, 6].

The first treatment of lumbar disc hernias is conservative treatment [3]. Conservative treatment contains exercise, use of analgesics and psychotherapy [26]. The purpose is to remove pain and inflammation, to increase function, to provide early activity, to prevent recurrence, to inform the patient and to ensure going back to normal life [3].

70% of the cases reach to full functional capacity within 4-6 weeks thanks to the conservative treatment, the treatment for those with progressive neurologic deficit and cauda equina syndrome who resist to conservative treatment and whose diagnosis is also proved radiologically is surgery [8, 27].

If the indications are cauda equina syndrome and progressive neurologic deficit, the final option is surgical in lumbar disc hernias [2, 3].

There are various options in surgical treatment including standard discectomy, micro discectomy, percutaneous discectomy or laser discectomy [28]. Surgical treatment should be considered for the cases who have persistent lower back and leg pain or neurological deficit despite the first conservative treatment [14, 29].

Only 15% of all lumbar disc hernias require surgical treatment. Today, the indications of lumbar disc surgery are determined with the evaluation of patients' clinical and laboratory findings and a method is selected according to the current surgical modalities. Although the prevalence of recurrent lumbar disc herniation changes between series, the average rate has been determined as 4% [8].

Surgical results of lumbar disc herniation have developed thanks to the developments in surgical technique and appropriate patient selection. Use of microscope in operations have contributed to these developments a lot. Small incision is performed with microscope, enlarged and illuminated appropriate view is provided, unnecessary retraction of neurological tissues is prevented. Correctly determined indication and keeping criteria limited in surgical intervention ensure good results after disc surgery. Success rates up to 98% are stated in retrospective studies [30]. Success rates in prospective studies have been reported as 75-80% [30, 31, 32].

In patients with lumbar disc hernia and without apparent stenosis, aggressive physiotherapy methods containing back school and stabilization exercises are affective in terms of pain and physical activity. Regression is particularly observed in the bigger, sequestered or extruded hernias. Immunohistochemical studies have indicated that the immune system perceives the nuclear material in the epidural cavity as a foreign matter and tries to wipe it out. Accordingly, blood vessels in epidural cavity are infiltrated into the nuclear material. Phagocytosis of nuclear material initiates with the inflammatory response and particularly macrophages. Co-existing blood vessels turn into granulation tissue and scar tissue in the end. Most probably, macrophages in resorption play an important role in endothelial cell proliferation and neovascularization with the fibroblast growth factor. Cytokines produced by macrophages play a role both in resorption and in degradation of the disc by stimulating inflammatory granulation tissue and metalloproteinase production of chondrocytes [33, 3]. Bed rest for 8-10 days, 1 intradural, 2 epidural injections, NSA and wearing a corset are required after the conservative treatment [3].

Radiological Imaging:

Direct radiography, myelography, Computerized Tomography, Magnetic Resonance Imaging, discography, scintigraphy, venography and epidurography can be used in order to examine lumbar vertebrae.

Direct Radiographies can yield plain lumbosacral graphics in lumbar disc hernias but with indirect findings. Pathology may not be found in 30-60% of patients in direct radiographies [8].

In myelography, contrast material is put in spinal subarachnoid space and formations in spinal canal are examined [8]. Decrease in size of extradural defects can be ascertained with myelography [8], and also spontaneous resolution of disc hernias can be directly indicated with the use of computerized tomography. MRI provides detailed information about the structure of disc hernia [14]. The accuracy rate of myelography have been found between the rates of 60-90% in various studies [8].

In discography, annulus fibrosis is entered with a thin puncture injection and contrast material is injected. It is observed that intradiscal pressure has reduced in herniated disc, injection has caused radicular pain, contrast material disperses irregularly and spreads to vertebral canal [8].

Computerized tomography is an important non-invasive diagnosis method in direct imaging of spinal pathologies and particularly disc hernia. This method based on the principle that the characteristics of tissues regarding the absorption of x-rays are different from each other depends on the technique of re-imaging from various absorption values in computer environment [8].

In Magnetic Resonance Imaging (MRI), radio frequency waves are sent to atoms within the magnetic field and the images are obtained by recording the formed magnetic resonance. This is the best method which examines the spine today. While Magnetic Resonance Imaging has the accuracy rate of 76.5% in diagnosis of lumbar disc hernia, it yields 35.7% false negative and 13.5% true positive results [8].

Application:

MRI was performed on all patients suspected of lumbar disc hernia following the detailed physical examination who applied to our clinic with the complaints of back pain, pain on legs and hip, numbness in legs and partial loss of strength. When the lumbar discopathies identified with MRI were found to comply with the complaints of patient, such treatments as medical, bed rest, rehabilitation, corset were applied and epidural steroid injection was applied to 86 patients giving insufficient response to these treatments (Figure 1a,b,c,d,e). Average age of our patients is 52.3. There are no obese patients. Nearly 72% of our patients are male. Our patients aren't diabetic.

Following the routine anesthetic evaluation of our patients, epidural cavity was reached with use of spinal needle by finding the appropriate level under the control of scopy and supervision of anesthetist with slight

sedation in operating room conditions. Normal saline was diluted into epidural cavity and injection with local anesthetic was performed. Average operation takes 20 minutes. Patients were kept in a short bed rest and follow-up after the procedure, their medical treatment was arranged and then they were discharged with follow-ups that will be carried out in clinics.

We achieved 62% success in these patients within 21 days. We determined an increase in back pain nearly in 16% of patients within the first 5 days and severe headache lasting for 10 days approximately in nearly 20% of them. All our patients whose complaints disappeared after the treatment were ensured to go back to their active life. High amount of fluid intake, analgesics and bed rest are recommended for the patients suffering from headache.

Discussion:

If an excessive load occurs on lumbar vertebra (gaining excessive weight and lifting heavy things), and if other structures particularly lumbar and core muscles ensuring lumbar support weaken (absence of exercise) or if degeneration occurs in these discs because of structural and genetic reasons, degeneration in these discs can cause back pain and disc herniation [1]. Back pain mostly manifests itself as the first symptom of the disease. It generally starts suddenly and gains continuity by intensifying from time to time [8, 21]. Conservative methods should be applied in first line treatment of lumbar disc herniation and surgical treatment should be preferred for those who have intractable back and leg pain and neurological sequela [14]. The purpose of treatment in LDH is to take the pain under control, to increase functional activity, to reduce labor loss, to prevent injury and to ensure rehabilitation in chronic cases [6, 24, 25]. Bed rest for 8-10 days, 1 intradural, 2 epidural injections, NSA and wearing a corset are required after the conservative treatment [3]. In order to obtain a successful result in lumbar disc herniation surgery, the cases candidate for surgery must be selected correctly and accurate surgical method (microsurgery) must be used. Therefore, indication criteria must be strictly followed and microsurgery must be preferred as the method [32]. However, we know that many patients can be treated with conservative treatment.

While 70% of the cases are aged between 30-50, 10% is aged 60 and over [8]. The average age of 52.3 in our study complies with the number stated in literature. All of our patients are those giving insufficient response to conservative treatment, the same method was applied to all patients by the same doctor and the success rate of 62% is the one obtained following the one epidural injection (Figure 1a,b,c,d,e). Back pain that appears within the first 5 days were taken under control with analgesics. We are of the opinion that the severe headache lasting for approximately 10 days in 20% of the patients is the factor which affects the patient comfort in epidural injection method most. We think that epidural steroid injection doesn't affect the social life of patients and it is an important treatment option for the cases giving insufficient response. There are some disadvantages for application such as requiring operating room conditions, use of scopy device and its cost. The fact that our study doesn't have obese and elderly patients is the limitation of our study. We believe that conducting some studies directed to development of different medicines and methods and increasing the efficiency of the method can be useful.

Effective methods yielding solutions in a short time are needed in treatment of back pain arising from the disc herniation which is a serious problem in society and leads to labor loss; therefore, epidural steroid injection which yields results in a short time is important for patients who don't give sufficient response to conservative methods.

Conclusion:

Low back pain comes second among the reasons for seeing a doctor. Lumbar disc herniation is determined in 1-3% of all patients consulting a doctor for low back pain. Work activities including bending and twisting that are frequently used in daily life, inappropriate weight lifting, awkward static posture and psychological stress are the causal factors in development of LDH. The treatment of lumbar disc herniation is firstly the conservative treatment. Surgical treatment is considered as the last resort.

In our study, we shared the success rate of 62% which we obtained with epidural steroid injection applied to 86 patients who don't give sufficient response to conservative treatments. Severe headache encountered after the method in 20% of our patients is the most important complication which affects the patient comfort. All of our patients whose symptoms disappeared after the treatment were ensured to go back to their active life. Epidural steroid injection is a significant option for back pain treatment arising from disc herniation which causes serious patient morbidity and labor loss in society and is encountered in middle aged individuals more frequently

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Annexes:

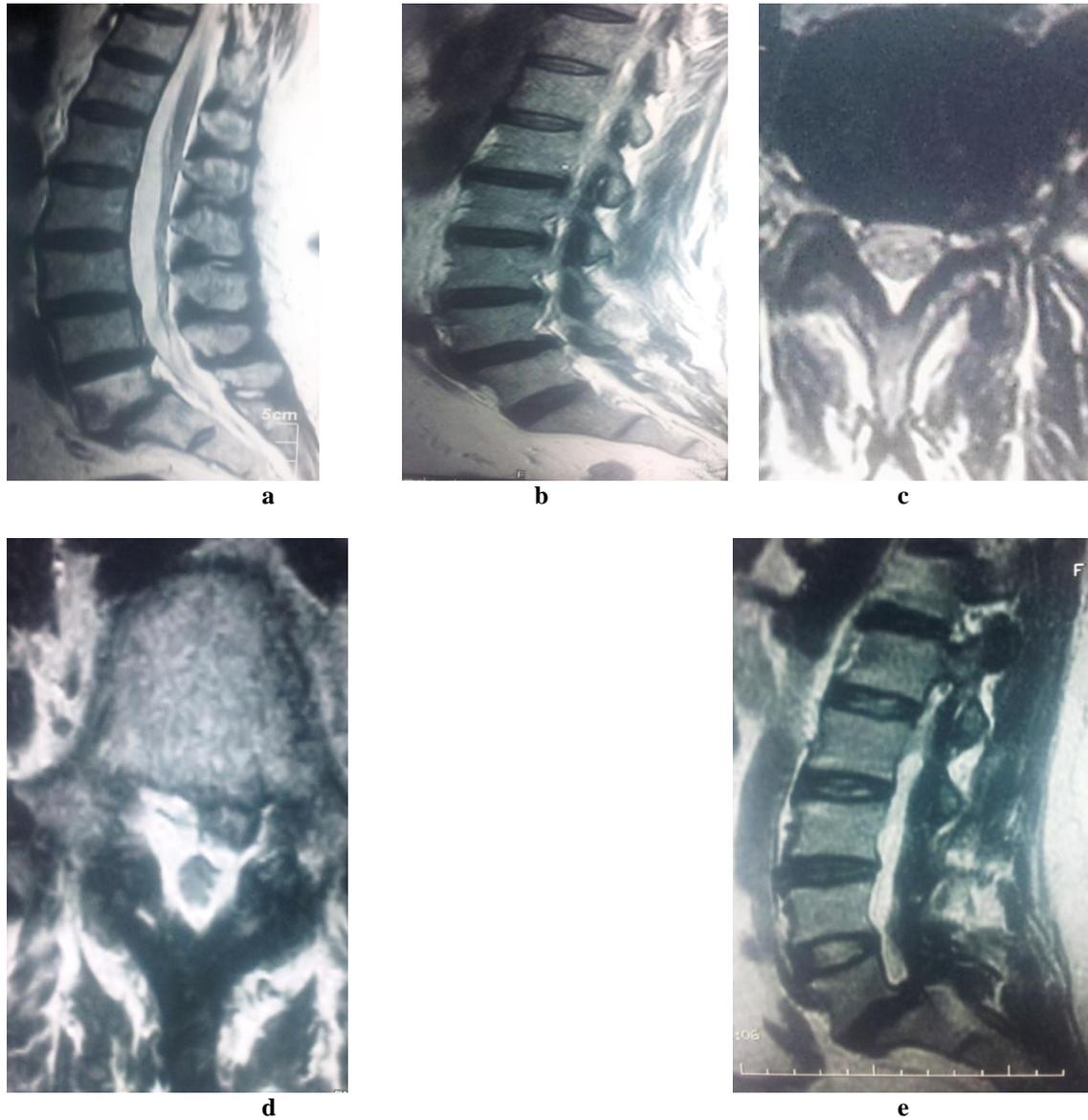


Fig. 1: Sample MR images of our patients with lumbar discopathy.