

The Potential Risks of Lumbar Disk Herniation Treatment

Haoke Han*

Department of Public Health, University of Washington, Seattle, The United States

*Corresponding author: haokeh@uw.edu

Abstract. Lumbar disc herniation has now become a relatively common lumbar disease, and surgical treatment has gradually matured. Whether the surgical intervention should be judged according to the diagnosis of imaging or the symptoms of the patient has also become a problem. In addition to surgery, doctors generally recommend that patients undergo conservative treatment first, and physical therapy is the most commonly used. Physical therapy includes manual therapy, rehabilitation exercises, and traction. The root of the problem is that the measures doctors take for patients should be based on the symptoms and feelings of the patients. Some patients may not be suitable for the treatment methods or rehabilitation exercises, which will lead to aggravation of the disease. At present, there are many ways to treat lumbar disc herniation, but on the basis of everything, it is necessary to ensure that patients are treated conservatively because the human body has the ability to repair itself.

Keywords: Lumbar Disk Herniation; Natural Healing; Physical Therapy; PRP Injection.

1. Introduction

One of the prevalent lumbar spine diseases in modern culture is lumbar disc herniation. The nucleus pulposus begins to deteriorate, and various degrees of degenerative changes take place under the influence of external forces, which is what causes the issue. The nucleus pulposus protrudes from the ruptured intervertebral disc's annulus fibrosus to the back or into the spinal canal, irritating or compressing the nearby spinal nerve roots and resulting in low back pain, numbness, pain in one or both lower limbs, and other clinical symptoms.

Lower back pain, numbness in lower limbs, radiating pain in the sciatic nerve, muscle atrophy, thinning of the affected leg, difficulty in walking, etc. It may also cause nerve root compression, resulting in corresponding organ dysfunction. The treatments now are Nonsurgical Treatment and Surgical Treatment. However, surgical treatment and non-surgical treatment both have some defects. For example, massage treatment is one of the no surgical considerations and it might be a bad choice for some patients to do because if the masseuse is not well trained, there will be more damage to the disc and eventually cause more pain. Surgical treatment has been controversial because recurring problems are very common after the surgery is done and for lots of patients who do not have any symptoms but the MRI shows a herniation, the doctor just sends them to surgery. It's not needed if the patients do not experience severe discomfort and the human body has its way of curing it. Medication, such as ibuprofen, physical therapy, and traction treatment are very helpful for lumbar disc herniation, especially during the early stage of the problem. However, the healthcare provider needs to be careful with some of the instructions based on different symptoms, and not all exercises are beneficial for all the patients. Therefore, this paper will summarize better alternative ways to treat lumbar disc herniation and discuss the advantages and disadvantages of certain treatments and ways to address them.

2. Evaluation and Treatment of lumbar disc herniation (Three levels)

When diagnosing whether the lumbar disc is herniated, the doctor usually tells the patient the degree of the protrusion. Different degrees also represent the severity of the back disease, and the smaller the protrusion, the easier it is to recover. Depending on the degree of protrusion, there will be several things to be aware of when treating the patients. In addition, non-surgical treatment is the first

choice when a lumbar disc herniation is diagnosed because the human body has the ability to repair itself.

2.1. bulging disc, herniated disc, and slipped disc

A bulging disc happens when the nucleus pulposus is protruding outward but the annulus fibrosus is not totally torn. A herniated disc usually protrudes further and is a partial or complete rupture of the annulus fibrosus, causing the nucleus pulposus in the disc to leak and put pressure on the surrounding spinal nerves [1].

A slipped disc has the same problem like the other two, but the protrusion of the nucleus pulposus is much further out than the herniated disc and compresses adjacent spinal nerves, which might cause pain down the lower limbs or the lower back associated with the specific nerve [2].

Non-surgical treatments are recommended first to treat these three different degrees of disc herniation. Medications, such as NSAIDs and muscle relaxers, Bed rest, physiotherapy, epidural steroid injections, and chiropractic care. Initial treatment of an acute herniated disc can begin with a short break to allow inflammation to subside [3]. Compared to standing and sitting, bed rest puts less stress on the discs, and many medical professionals advise patients to keep their bodies in the supine position for a certain amount of time. Bed rest is recommended for up to 1 week, followed by a gradual return to normal activities. Gilbert et al. discovered that the bed rest group needed 42% more time than those who remained active to reach normal activity levels, suggesting that only general mobilization may be sufficient to treat low back pain [4]. Medications such as ibuprofen or naproxen are usually used for treatment. They are nonsteroidal anti-inflammatory drugs (NSAIDs) that can reduce inflammation and pain. This type of drug has mixed and conflicting effects in relieving low back pain and sciatica. NSAIDs are beneficial for acute low back pain but provide little help for chronic low back pain. Additionally, there is proof that NSAIDs are more efficient than muscle relaxants. People generally use ibuprofen but there is no specific NSAID proven to be most effective [4]. There are also medications available for nerve pain, which often have the added benefit of relieving radiating pain in the buttocks and legs from a herniated disc. However, a common side effect that often occurs is drowsiness, which can help patients fall asleep better but is not recommended to be taken or taken at a lower dose when working during the day [2]. Depending on the patient's symptoms and physical condition, the physiotherapist will first aim to improve pain and then enhance back and core muscle strength, flexibility, and endurance [2]. Core strength is important because it can be used to stabilize the lumbar spine. A bare spine without muscles cannot withstand a lot of compressive loads [5]. Gentle stretching and other pain-relieving techniques including ultrasonography, whirlpools, cold and heat treatment, electrical stimulation, and massage are all a part of physical therapy. Some patients reduce pain by performing lumbar flexion, extension, or lateral/rotational movements [4]. Patients who don't respond well to short-term noninvasive treatment after three to four weeks may be suited for epidural steroid injections [3]. Epidural Steroid Injections to Reduce Herniated Inflammation The main problem stems from the release of inflammatory agents from lumbar disc herniations leading to significant factors in pain and nerve root irritation. For up to three years, treatment is beneficial. However, there did not appear to be a difference in protrusion size between individuals who responded and those who did not. According to the researchers of one trial, epidural steroid injections were 77% effective in reducing symptoms over a 27-month period in patients who had unsatisfactory results from nonsurgical therapy and required consideration for surgery [4].

2.2. The natural healing process of the herniated disc, surgery is not the first choice

Lumbar disc herniation can be treated with surgical and conservative methods. In about 90% of patients with lumbar disc herniation, sciatica caused by the acute phase, begins to improve within six weeks and resolves within 12 weeks of non-surgical treatment [6]. Ito and other researchers believe that patients with uncontained lumbar disc herniation don't need surgery if they can tolerate symptoms within the first 2 months. Patients with disc herniation achieved satisfactory results after

several months of conservative treatment. So, improving symptoms this way can happen, especially in patients with mild or moderate nerve root compression [7]. Microendoscopic discectomy is a minimally invasive surgical procedure for treating lumbar disc herniation, but Morio et al. discovered that this benefit may be lost due to an early postoperative recurrence. More than half of recurrence cases occur in the early postoperative period [8]. It is currently not possible to identify which patients are likely to require surgery in the future by using clinical features and imaging at the early onset of the disease [9]. Although MRI is utilized in the diagnostic assessment of LDH, little research has been done on the prognostic usefulness of MRI findings in LDH and its predictive value for necessary surgery; as a result, it is not frequently used as a criterion for surgery [10].

In fact, the human body has the ability to repair itself and can also repair the herniated lumbar disc. The body normally clears foreign substances from the body by activating macrophages and monocytes, cells that attack and destroy foreign substances. The intervertebral disc is herniated, and the position of the nucleus pulposus is misplaced, just like the sandwich in a donut flows out, which is considered a foreign body. Macrophages and monocytes cooperate to make the nucleus disappear. In addition, the nucleus pulposus contains more water contents in larger herniated discs. Protruding discs can dehydrate over time. Over time, the herniated disc shrinks so that it does not irritate the nerve or tissue. The body also heals the tear in the annulus and reattaches the annulus fibers. However, it is a weaker area, and there is a small but increased refracture variation [11]. If the patients can live with your current pain, allow their body to begin the process of removing their herniated disc. But if there is loss of muscle strength, loss of bowel or bladder control, difficulty walking, and severe and unbearable pain, you should go to the hospital because this may have injured a nerve, and usually requires surgical intervention at this time [12].

3. Suggestions and Solutions

3.1. Bed Rest

In the acute stage of lumbar disc herniation, the best way is to rest for a few days. The pressure on the lumbar spine is minimal when lying flat. Lying flat on a medium-hard bed with a pillow under the knees relaxes the back and core muscles to avoid muscle spasms [2]. Dr. Kovacs et al. randomized participants to a firm mattress or a moderately firm mattress for 90 days to clinically assess improvement in pain while primarily lying in bed. In comparison to patients on firm mattresses, they discovered that individuals on medium-firm mattresses experienced reduced ascending pain ($p=0.008$), low back pain during the day ($p=0.059$), and pain when lying in bed ($p=0.064$). The main point of the harness of the bed is to support the lower back but not too much support. A mattress that is too soft or too firm will not allow your back to rest and will put pressure on areas of your back and neck [13].

3.2. Physical Therapy-Traction

Physical therapy is currently the recognized first choice when a herniated disc is diagnosed. Since the discs between the vertebrae have little to no blood flow, they are avascular. Therefore, only fluid diffusion to the vertebral bodies' endplates can provide nutrition for the intervertebral discs and eliminate waste. Exercise is essential for disc hydration, nutrition, and maintaining a balance between water and proteoglycan content because it encourages the diffusion of solutes through the spinal endplates. A physical therapist can use techniques such as manual therapy or traction to relieve pressure on a herniated disc [1]. Some common physical therapy approaches for herniated discs include manual therapy, therapeutic exercises, and traction. Traction therapy involves opening up space between the vertebrae of the spine to reduce pressure on the discs and relieve pain associated with herniated discs [12]. In a short amount of time, lumbar traction alone can relieve nerve root compression brought on by inflammation [14], but it will raise the risk of lower back injuries [15]. Furthermore, spinal mobility is not increased by lumbar traction. According to Prasad et al., physical therapy and intermittent traction can help lumbar disc herniation patients live better lives by

improving their clinical symptoms and function. Surgery can be considerably avoided with intermittent traction [16]. A physical therapist can provide specific exercises and stretches to help strengthen the muscles that support the spine, improving stability and flexibility [12]. This also solves the problem that lumbar traction cannot solve by itself.

3.3. McKenzie Method

Physical therapy is mostly helpful for all the patients with the exercises that the instructor assigned, but some patients feel worse after doing them. In physical therapy, doctors often recommend McKenzie soft-side push-ups, which are done with floppy push-ups. The McKenzie technique is a good treatment for reducing short-term pain, according to a number of pain metrics [17]. The main point of the movement is to face down, the buttocks do not leave the ground, and the hands exert force to slowly move the head and upper body away from the floor. The main principle is to create a spinal position where the vertebrae press down behind the disc space, pushing the disc protruding back into place. However, excessive spinal extension can cause damage to the facet joints by repeatedly pushing them together. This repetitive extension can exacerbate the symptoms of a herniated disc. But as long as the patients change the range of motion slightly, the effect will be better. Do it in the exact same way as a floppy pushup, but just keep the chin about a fist-sized from the ground, and lift the head and chest slightly off the floor. This small extension still pushes the material forward into the disc but reduces the compression on the facet joints [18]. Patients with herniated discs should be advised by physicians to avoid any quick full-range movements, such as sit-ups, and any rapid motions involving repetitive end-range spinal flexion or extension [1].

3.4. Lumbar Intradiscal Platelet-Rich Plasma Injections

PRP is an effective treatment option for herniated discs other than surgery. PRP Platelet Rich Concentrate is packed with growth factors that increase blood flow, reduce inflammation, and promote disc repair. Most structures of the spine have little or poor blood flow [12]. Yetsa A. Tuakli-Wosornu et al. concluded in the PRP injection experiment that participants receiving intradiscal PRP had better functional rating index (FRI), Pain Numeric Rating Scale (NRS) pain, and NASS patient satisfaction within 8 weeks significant score improvement. Also, patients who received PRP maintained significant improvement in FRI scores at least one year of follow-up [19].

4. Conclusion

Overall, it is crucial that surgery does not just rely on imaging, given the symptoms and treatment of lumbar disc herniation as well as some of the potential risks of non-surgical and surgical treatments. Healthcare providers should listen to patients' feelings and concerns. Conservative treatment is always the first choice and healthcare providers need to modify certain exercises based on patients' symptoms. In the future, it's important for healthcare providers to communicate with patients often and a combination of both knowledge and reality. Each patient is different, so they have different feelings which are not based on healthcare knowledge. There are lots of substitutes for rehab exercises and ways to cure a lumbar disc herniation.

References

- [1] Permar G. Proven Herniated Disc Exercises...Jumpstart Healing, Erase Pain. Crush Back Pain. 2020-05-07/2023-09-06. <https://crushbackpain.com/herniated-disc-exercises/>.
- [2] CHOW Hung-Tsan. "Slipped Disc" FAQs | Spine | Doctor Articles | Asia Medical Specialists//asiamedicalspecialists.hk. <https://asiamedicalspecialists.hk/en/health-info/3/>.
- [3] Weiner B. Treatment of lumbar disc herniation: Evidence-based practice. International Journal of General Medicine, 2010, 3(2010): 209–214.

- [4] Awad J N, Moskovich R. Lumbar Disc Herniations. *Clinical Orthopaedics and Related Research*, 2006, 443: 183–197.
- [5] Akuthota V, Nadler S F. Core strengthening11No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit upon the author(s) or upon any organization with which the authors is/are associated. *Archives of Physical Medicine and Rehabilitation*, 2004, 85(1): 86–92.
- [6] Gregory D S, Seto C K, Wortley G C, et al. Acute Lumbar Disk Pain: Navigating Evaluation and Treatment Choices. *American Family Physician*, 2008, 78(7): 835–842.
- [7] Ito T, Takano Y, Yuasa N. Types of Lumbar Herniated Disc and Clinical Course. *Spine*, 2001, 26(6): 648.
- [8] Matsumoto M, Watanabe K, Hosogane N, et al. Recurrence of lumbar disc herniation after microendoscopic discectomy. *Journal of Neurological Surgery. Part A, Central European Neurosurgery*, 2013, 74(4): 222–227.
- [9] Peul W C, van Houwelingen H C, van der Hout W B, et al. Prolonged conservative treatment or «early» surgery in sciatica caused by a lumbar disc herniation: rationale and design of a randomized trial. *BMC Musculoskeletal Disorders*, 2005, 6(1).
- [10] Motiei-Langroudi R, Sadeghian H, Seddighi A S. Clinical and Magnetic Resonance Imaging Factors Which May Predict the Need for Surgery in Lumbar Disc Herniation. *Asian Spine Journal*, 2014, 8(4): 446–452.
- [11] Shim D. Disc Herniations or Slipped Discs Get Better Without Surgery. *ShimSpine*. 2019-10-14/2023-09-06. <https://www.shimspine.com/disc-herniations-or-slip-discs-get-better-without-surgery/#:~:text=With%20time%2C%20the%20disc%20piece>.
- [12] Markle J. How To Heal A Herniated Disc Naturally. *Centeno-Schultz Clinic*. 2021-02-18/2023-09-06. <https://centenoschultz.com/how-to-heal-a-herniated-disc-naturally/>.
- [13] Kovacs F M, Abaira V, Peña A, et al. Effect of firmness of mattress on chronic non-specific low-back pain: randomised, double-blind, controlled, multicentre trial. *The Lancet*, 2003, 362(9396): 1599– 1604.
- [14] Liu Z, Wen H, Zhu Y, et al. Short-Term Effect of Lumbar Traction on Intervertebral Discs in Patients with Low Back Pain: Correlation between the T2 Value and ODI/VAS Score. *CARTILAGE*, 2021, 13(1_suppl): 414S423S.
- [15] Kumari A, Quddus N, Meena P R, et al. Effects of One-Fifth, One- Third, and One-Half of the Bodyweight Lumbar Traction on the Straight Leg Raise Test and Pain in Prolapsed Intervertebral Disc Patients: A Randomized Controlled Trial. *BioMed Research International*, 2021, 2021(2021): 2561502.
- [16] Prasad K S M, Gregson B A, Hargreaves G, et al. Inversion therapy in patients with pure single level lumbar discogenic disease: a pilot randomized trial. *Disability and Rehabilitation*, 2012, 34(17): 1473– 1480.
- [17] Namnaqani F I, Mashabi A S, Yaseen K M, et al. The effectiveness of McKenzie method compared to manual therapy for treating chronic low back pain: a systematic review. *Journal of Musculoskeletal & Neuronal Interactions*, 2019, 19(4): 492–499.
- [18] Christopherholetraining. The Limitations of the McKenzie floppy push up. www.christopherholetraining.com. 2021-05-17/2023-09-06. <https://www.christopherholetraining.com/blog/mckenzie-floppy-push-up>.
- [19] Tuakli-Wosornu Y A, Terry A, Boachie-Adjei K, et al. Lumbar Intradiscal Platelet-Rich Plasma (PRP) Injections: A Prospective, Double-Blind, Randomized Controlled Study. *PM&R*, 2015, 8(1): 1–10.