



A Comparative Study of Conservative versus Operative Management of Lumbo-Sacral Intervertebral Disc Herniation

Authors

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Introduction

Back pain, is still, one of the unrewarding problems to deal with in clinical medicine. Of the various forms of low back pain, only those syndromes associated with neurologic compression of the cauda equina or nerve roots, have reasonably well understood clinical presentation.

Nearly 80% of the population sustains an episode of low back pain (LBP) once during their lifetime^[1]. LBP has high prevalence and significant contribution to disability. Within the vast differential of LBP, the most common source is intervertebral degeneration leading to degenerative disc disease and lumbar disc herniation^[2]. Thus, an effective understanding of lumbar disc herniation (LDH), its origins, and how to appropriately treat LDH is of substantial importance.

Disc herniation is a greater threat in younger individuals between the ages of 30 and 50 years, in whom the nucleus material has good turgor, in contrast to older individuals in whom the nucleus is desiccated and fibrotic.

The intervertebral disc consists of an inner nucleus pulposus (NP) and an outer annulus fibrosus (AF). The central NP is a site of collagen

secretion and contains numerous proteoglycans (PG) 34. The NP is primarily composed of type II collagen. In contrast, the AF functions to maintain the NP within the center of the disc with low amount of PG and primarily concentric type I collagen fibers^[3,5,6]. Several changes in the biology of the intervertebral disc are thought to contribute to LDH. These include reduced water retention in the NP^[5,7,8], increased percent of type I collagen within the NP and inner AF^[9], degradation of collagen and extracellular matrix (ECM) materials^[10], and upregulation of systems of degradation such as apoptosis, matrix metalloproteinase (MMP) expression, and inflammatory pathways^[11]

Nomenclature

Disc Herniation: It is defined as a focal displacement of disc material (less than 25% of the disc circumference) beyond the limits of the intervertebral disc space.

- It can be contained (cover by outer annulus fibrosus) or uncontained.

Protrusion– It indicates that the distance between the edges at the dome of disc is less than the distance between the edge at base.

Extrusion- It indicates that the distance between the edges at dome of the disc is greater than the distance at the base.

- Extrusion is associated with a defect in the annulus fibrosus and are usually noncontained.

Sequestration – This term is used to indicate the displaced disc material has lost continuity with the parent disc.

Disc Migration– It indicates displacement of disc material away from the site of extrusion either up or down regardless of sequestered or not.

Management

The natural history of sciatica is predominantly that of spontaneous improvement. The protruded disc lesion can be reabsorbed by granulation tissue and the defect in the annulus fibrosus, repaired by fibrous tissue formation ¹². This removal of pressure from the nerve root relieves the symptom.

Conservative Treatment ^{13,14};

Most patients with lumbar disc herniation, even symptomatic varieties, benefits from conservative treatment. Patients with a definite diagnosis of herniated lumbar intervertebral disc and sciatica, with neurological signs and symptoms should be carefully observed and treated by non surgical means for 4-8 weeks, unless there is progressive loss of motor, bladder or bowel function before.

More than 90% of the patients will be better with conservative treatment alone.

Pain relief in the initial acute stage, is important, both for the comfort of the patient and for the ability to perform an examination.

Bed Rest: The simplest treatment for acute back pain is rest. Pain relief is usually experienced by a patient confined to bed. A supine position with knees and hips flexed is probably optimum.

Medication: A short course of analgesics such as NSAIDS, opioids, antidepressant and muscle relaxant.

- Heat therapy, ice therapy, massage, spinal manipulation, spinal traction, acupuncture,

advise to stay active, exercise therapy.

Selective nerve root block: Transforaminal selective nerve root block with a combination of local anesthetics drugs and a long acting corticosteroid may give pain relief.

Surgical Treatment

A) Open methods: Open discectomy is the gold standard for operative intervention in patient with herniated disc where conservative management fails.

- Posterior approach
- Postero-lateral approach
- Mixed posterior and posterolateral approach

B) Microscopic lumbar discectomy :

- It allows magnified visualization of the precise pathology through a small incision with the help of microsurgical instruments.
- Less traumatic soft tissue dissection.
- Easier identification of deep seated structure
- Gentle manipulation of neural structure.
- It can also performed using a tubular retractor with a muscle splitting technique.

C) Percutaneous lumbar Endoscopic Discectomy :

When endoscope is inserted percutaneously into the disc space through a posterolateral or transforaminal approach for removal of disc fragments.

Aims and Objectives

Primary objective

- To Diagnose lumbo-sacral intervertebral disc herniation by clinical presentations, examinations and radiological finding of the patients.
- To evaluate outcomes of both conservative and surgical management.

Review of Literature

Though humans have been tormented by back and leg pain since the beginning of recorded

history, it astonishes that origin of disc related sciatica and clinical neurologic findings were not recognized until the 20th century. Lumbar disc surgery and intra discal therapy are relatively recent developments.

Intervertebral disc as such was first described by 'Andreas Vasalius' a Belgian Anatomist in 1543. In 1764, 'Dominico Cotunio' described sciatica as a clinical entity and for many years sciatica was being known as Cotunio's disease. In 1857, Virchow has given fuller account of intervertebral disc, which was elaborated by 'Von Luschka' in 1858. In 1864 'Lasegue' described the carriage and posture characteristically associated with sciatica pain. Thus, relating sciatica and low back pain very closely.

An earliest report on an actual posterior displacement of intervertebral disc is described by 'Kocher' in 1898. The site of lesion was in between L1 and L2 vertebrae. In 1911 'Goldthwaite' published a paper and showed diagrammatically the retropulsion of disc in L5 and S1. In the same year 'Middleton' in Glasgow described 'Paraplegia' due to slipped disc following heavy weightlifting.

In the year 1927, Putti classified these irritations of the sciatic nerve according to the site of the causal lesion and he came out with terms like radiculitis, ganglionitis, funiculitis, plexitis and neuritis. He concluded that most sciatica were due to irritation of nerve roots in the spinal foramina.

Materials and Methods

Source of data

Patients presenting with signs, symptoms & radiological feature of Intervertebral Disc herniation, to the Department of Orthopaedics, Katihar Medical College and Hospital, Katihar.

Method of Collection of Data

Inclusion Criteria

All patients in the age group of 20 to 70 yr with herniation of intervertebral disc, clinical

symptoms and signs, and radiological evidence.

Exclusion Criteria

Patients with Intervertebral disc herniation associated with

- Structural scoliosis ,
- Spondylolisthesis
- Congenital anomalies
- Developmental dysplasia
- Infections of spine specific or nonspecific
- Cauda Equina syndrome
- Failed back syndrome
- Disc herniations at multiple levels
- Tumours of lumbar spine
- Cardiac disease
- Coagulopathy and other high surgical risk patients.

Sample size: 60 cases

Study Type: a prospective study.

Study Duration: DEC.2020 TO DEC.2022.

Patients are to be followed up at 1st, 3rd & 6th. Months postoperatively or following conservative management.

Patients will be assessed by Japanese Orthopedic Association Backache Score before and after treatment.

Observation and Discussion

The results will be compiled, tabulated and compared with previous studies.

Summary and Conclusion

On the basis of outcomes of all observations and results, data will be analysed to reach a definite summary and conclusion of present study under the direct guidance of Dr. Md. Mohtashemul Haque, Department of Orthopaedics, Katihar Medical College and Hospital, Katihar.

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ANNEXURE –B

UNDERTAKING

I/We agree to abide by the ethical guidelines for biomedical research on human subjects)As per the ICMR guidelines (while the research project being submitted for Ethical Committee consideration.

1. Project is considered to be absolutely essential for the advancement of knowledge and for the benefit of all.
2. Only subjects who volunteer for the project will be included. Their informed consent will be obtained to commencement of the research project and subjects will be kept fully apprised of all the consequences.
3. Privacy and confidentiality of the subjects shall be maintained and without the consent of the subject no disclosure will be made.
4. Proper precautions shall be taken so as to minimize risk and prevent irreversible adverse effects.
5. Research will be conducted by the professionally competent person.
6. Research will be conducted in a fair, honest, impartial and transparent manner. Research will be accountable for maintaining proper records.
7. Research will be conducted keeping in view the public interest at large.
8. Research reports, material and data will be preserved)as per institutional guidelines
9. Results of research will be made known through scientific publication.
10. Professional and moral responsibilities will be of the researchers, directly or indirectly connected with the research.
11. Only those drugs which are approved by the Drug Controller of India for a specific purpose will be used in the research project.