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Extruded disc at L4 and L5 with L5 sacarlised

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Abstract
Our case highlights basics of Lumbar disc herniation, various factors causing it, along with introduction to terminologies, prospects of treatment and various modalities used for treatment. It also elaborates comparison between three methods of micro discectomy, percutaneous endoscopic lumbar discectomy and open fenestration discectomy used in the treatment of lumbar disc herniation. Advantages and disadvantages of all three methods are discussed.

Keywords: microscopic discectomy, percutaneous endoscopic lumbar discectomy, open fenestration discectomy

Introduction

Lumbar disc herniation (LDH) is a frequently-occurring and common spine-related disease in orthopedics, which is the most common cause of low back and leg pain. It has bothered the lives' quality of the patients severely. The long-term chronic low back pain may cause disability, according to the statistics of World Health Organization [1].

Several words are used to describe the extent of a disc herniation seen on MRI examination. A disc herniation occurs when the soft cushion between the spinal bones ruptures. A portion of that disc can herniate, or push outwards, against the spinal cord or the spinal nerves. The pressure on the nerves causes the symptoms typical of a disc herniation. The types of disc herniation that occur include:

- **Disc Protrusion:** Commonly called a disc bulge, a disc protrusion occurs with the spinal disc and the associated ligaments remain intact but form an outpouching that can press against the nerves.
- **Disc Extrusion:** A disc extrusion occurs when the outer part of the spinal disc ruptures, allowing the inner, gelatinous part of the disc to squeeze out. Disc extrusions can occur with the ligaments intact, or damaged.
- **Disc Sequestration:** A disc sequestration occurs when the center, gelatinous portion of the disc is not only squeezed out but also separated from the main part of the disc.

The lumbar spine is the most common spinal location for disc herniation. Despite lumbar disc herniation (LDH) being one of the most frequent reasons for lumbar surgery [2], there is still conflicting evidence regarding its suitability and long-term outcomes for many cases. Brox [3], for example, reported "*there is strong evidence that in carefully selected patients with sciatica due to lumbar disc prolapsed; discectomy provides faster relief from the acute attack than conservative treatment.*"

Case Presentation

A 40 year old female patient presented to Out-patient Department with History of chronic on and off back pain associated with difficulty to bend forward and difficulty to walk. The pain was mild, intermittent 6/10 in intensity radiating sometimes to thighs. Pain was aggravated by lifting heavy loads and relieved on rest but not relieved by NSAIDS. Patient was referred for x-ray (figure 1) followed by MRI. MRI was suggestive of desiccation of L5 S1 intervertebral disc and diffuse bulge with right paracentral disc extrusion and inferior migration is seen at L5-S1, causing indentation of thecal sac, encroachment of right transverse S1 nerve root (figure 2, 3)

Patient was then admitted to hospital for further management. During hospital stay, regular work up was done. Routine work up was within normal limits (table1). Echocardiography was suggestive of normal sized chamber. Normal LV systolic function LVEF -60%. No regional wall motion abnormality at rest. Chest x-ray was normal not suggestive of any abnormality.

Patient was scheduled for Endoscopic Discectomy which was uneventful. Patient was discharged after 2 days and was advised to take proper rest, take regular medication, regular follow up, to walk daily, not to sit on floor, not to bend from back, not to sit for >20min at a time.

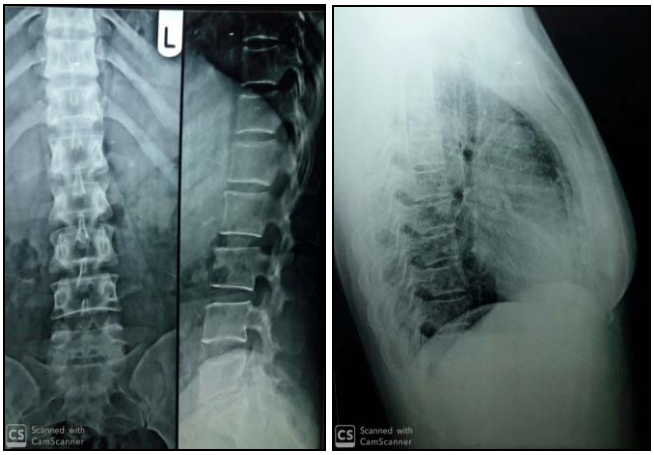

Fig 1

Fig 2

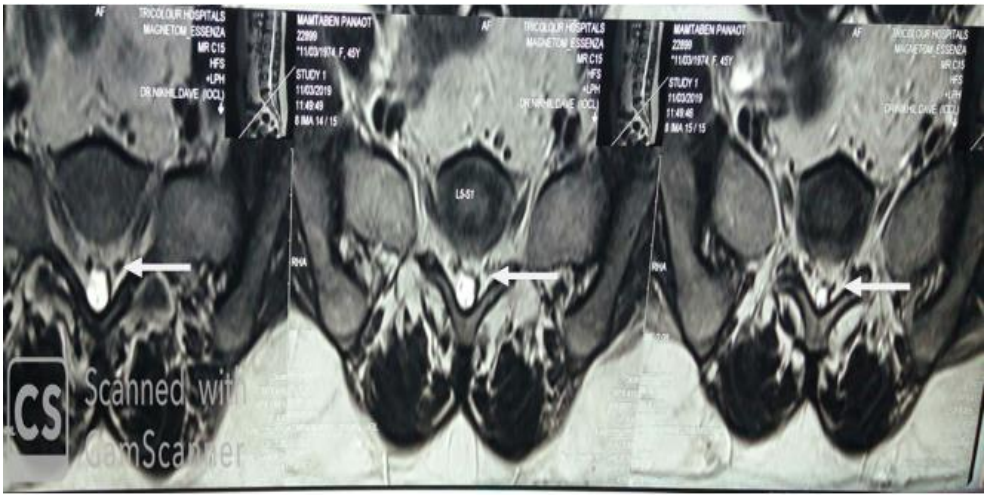

Fig 3

Table 1

Test	Result	Reference Range
Haemoglobin	13.3	12 - 16 gm%
Blood Group	A Positive	
RBC Count	4.77	3.8 - 4.8 million/cmm
HCT	41.3	36 - 48%
MCV	86.6	83 - 101 fl
MCH	27.9	26.4 -33.2 Pg
MCHC	32.2	31.8 – 35.9%
RDW-CV	12.6	11.6 – 14.0%
Total WBC Count	5780	4000 - 10000/cumm
Platelet Count	390	150 - 450 thou/cumm
Mean Platelet Count	9.90	7.5-10.3 fL
Smear Examination	Adequate	
APTT	Test - 27.8, Control – 29.9	25.0 – 33.0 Seconds
Ratio	0.93	0.8 – 1.2
Prothrombin Time	Test – 14.6, MNPT- 12.9	11.5 – 14.1 Seconds
INR	1.17	Non-Therapeutic: upto 1.2 Therapeutic Range: 2.0 – 3.0
Random Glucose	106	<140 mg/dl
S. Creatinine	0.6	0.52 – 1.04 mg/dl
HIV 1 and 2	0.07	<1.0 S/Co : Non-Reactive >=1.0 S/Co: Reactive
HBsAG	0.20	<1.0 S/Co : Non-Reactive >=1.0 S/Co : Reactive
Anti – HCV	0.08	<1.0 S/Co : Non-Reactive >=1.0 S/Co: Reactive

Conclusion

Terms used in treatment of lumbar disc herniation:

- **Discectomy -** This involves removal of the herniated portion of a disk to relieve irritation and inflammation of a nerve. Discectomy typically involves full or partial removal of the back portion of a vertebra (lamina) to access the ruptured disk.
- **Laminectomy -** This procedure involves the removal of

the bone overlying the spinal canal. It enlarges the spinal canal and is performed to relieve nerve pressure caused by spinal stenosis.

- **Fusion -** Spinal fusion permanently connects two or more bones in your spine. It can relieve pain by adding stability to a spinal fracture. It is occasionally used to eliminate painful motion between vertebrae that can result from a degenerated or injured disk.
- **Artificial disks -** Implanted artificial disks are a treatment alternative to spinal fusion for painful movement between two vertebrae due to a degenerated or injured disk. But these relatively new devices aren't an option for most people.

The three methods of micro discectomy, percutaneous endoscopic lumbar discectomy and open fenestration discectomy in the treatment of lumbar disc herniation can obtain the same satisfactory results of therapy, but the microscope methods have advantages of minimal invasion, less blood loss, shorter operation time, shorter hospitalization time, fewer medical expenses etc, which can be one of the ideal minimally invasive operations.

The advantage of percutaneous endoscopic lumbar discectomy is a significant reduction in return to normal activity times, hospitalization for temporary disability, and level of back pain in the early postoperative period. These aspects lead to shorter rehabilitation times for patients. Disadvantages of percutaneous endoscopic lumbar discectomy are a lack of sufficient radicality due to ossification of the hernia and/or complicated anatomy of the intervertebral foramen in clinical cases. The developed algorithm divides herniated intervertebral discs by anatomical localization, size, and the presence of osteophytes, and determines the optimal tactics of surgical treatment by endoscopic methods.

According to the Spine Institute of San Diego, a micro discectomy procedure is up to 95 percent effective at eliminating sciatica pain caused by disc herniation.

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