Low back pain / HNP LUMBAL

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Epidemiology

- Almost any structure in the back can cause pain, including ligaments, joints, periosteum, musculature, blood vessels, annulus fibrosus and nerves
  - Intervertebral discs and facet joints most commonly affected
  - 85% of those with isolated low back pain do not have a clear localization
    - Usually called “strain” or “sprain” → no histopathology, no anatomical location
- Men and women equally affected
- Age of onset 30-50 years
Epidemiology

• Leading cause of work disability in those < 45 years
• Most expensive cause of work disability in terms of worker’s compensation
• Multiple known risk factors:
  – Heavy lifting, twisting, vibration, obesity, poor conditioning
Common Pathoanatomical Conditions of the Lumbar Spine

Physical Examination

• Inspection of back and posture (ie. Scoliosis, kyphosis)
• Range of motion
• Palpation of the spine (vertebral tenderness sensitive for infection)
• If high suspicion of malignancy, do a breast/prostate/lymph node exam
• Peripheral pulses to distinguish from vascular claudication
Klasifikasi LBP

• Viscerogenic : kelainan dari ginjal
• Vasculogenic : aneurisma abdomen
• Neurogenic : stenosis canalis spinalis, neoplasma intracanalis spinalis, arachnoiditis
• Spondilogenic
• Psychogenic
• Osteogenic : spondilitis TB, spondilolisthesis, osteomyelitis vertebra, metastase
• Discogenic : spondilosis, HNP, spondilitis anklilosis
• Miogenik : spasme otot, myofasial pain syndrome
Physical Examination

- **Straight leg raise**: for those with sciatica or spinal stenosis symptoms
  - Patient supine, examiner holds patient’s leg straight
  - Elevation of less than 60 degrees abnormal and suggests compression or irritation of nerve roots
  - Reproduces sciatica symptoms (NOT just hamstring)
  - Ipsilateral straight leg raise sensitive but not specific for herniated disk
  - Crossed straight leg raise (symptoms of sciatica reproduced when opposite leg is raised) insensitive byt highly specific
Physical examination

- Neurologic examination
  - L5: ankle and great toe dorsiflexion
  - S1: plantar flexion, ankle reflex

- Dermatomal sensory loss
  - L5: numbness medial foot and web space between 1\textsuperscript{st} and 2\textsuperscript{nd} toes
  - S1: lateral foot/ankle
<table>
<thead>
<tr>
<th>Nerve root</th>
<th>L4</th>
<th>L5</th>
<th>S1</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><img src="image.png" alt="Image" /></td>
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<tr>
<td>Pain</td>
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<tr>
<td>Numbness</td>
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<tr>
<td>Motor weakness</td>
<td>Extension of quadriceps</td>
<td>Dorsiflexion of great toe and foot</td>
<td>Plantar flexion of great toe and foot</td>
</tr>
<tr>
<td>Screening examination</td>
<td>Squat and rise</td>
<td>Heel walking</td>
<td>Walking on toes</td>
</tr>
<tr>
<td>Reflexes</td>
<td>Knee jerk diminished</td>
<td>None reliable</td>
<td>Ankle jerk diminished</td>
</tr>
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Lumbar disc herniation

Introduction
Definition of disc herniation

Abnormal rupture of the soft gelatinous central portion of the disc (nucleus pulposus) through the surrounding outer ring (annulus fibrosus). In about 95% of all disc herniation cases, the L4-L5 or L5-S1 disc levels are involved.
• Disc herniation occurs when the annulus fibrous breaks open or cracks, allowing the nucleus pulposus to escape.

• This is called a Herniated Nucleus Pulposus (HNP) or herniated disc
L5-S1 Disc Herniation with Compression of Cauda Equina

Film Interpretation

Area of Injury

L5-S1 central herniation of the nucleus pulposus

Deformity of the thecal sac impinging on the cauda equina

Cauda equina of spinal cord
Causes of lumbar disc herniation

1. Trauma or injury to the disc
2. Disc degeneration
3. Congenital predisposition
There are three types of disc herniation:

1. Protrusion / bulge
2. Disc herniation
3. Sequestration (disc rupture)

![Disc Bulge (A)](image1)
![Herniated Disc (B)](image2)
![Disk Rupture (C)](image3)
Typical locations of disc herniation

Central

• It is rare condition, it will affect multiple nerve roots, patient will have back pain more than leg pain and it may cause incontinence of the bladder and bowel. Urgent surgical treatment is necessary if patient presents with neurological deficits.
Typical locations of disc herniation

Posterolateral

• Usually it is the most common location, it involve one nerve root (the lower one).

Foraminal

• It occurs in about 8-10% of all cases. It involves the exiting nerve.
Clinical manifestations of disc herniation

- **If the herniated disc is:**
  - **Not** pressing on a nerve, you may have an ache in the low back or no symptoms at all.
  - **Pressing** on a nerve, you may have pain, numbness, or weakness in the area of your body to which the nerve travels.
Clinical manifestations of disc herniation

– With herniation in the lower (lumbar) back, sciatica may develop. Sciatica is pain that travels through the buttock and down a leg to the ankle or foot because of pressure on the sciatic nerve. Low back pain may accompany the leg pain.
Clinical manifestations of disc herniation

• **Leg pain caused by a herniated disc**
  • Usually occurs in only one leg.

• May start suddenly or gradually.

• May be constant or may come and go (intermittent).

• May get worse ("shooting pain") when sneezing, coughing, or straining to pass stools.
Leg pain caused by a herniated disc (cont...) 

- May be **aggravated** by sitting, prolonged standing, and bending or twisting movements.

- May be **relieved** by walking, lying down, and other positions that relax the spine and decrease pressure on the damaged disc.
Clinical manifestations of disc herniation

- Nerve-related symptoms caused by a herniated disc include:
  - Tingling ("pins-and-needles" sensation) or numbness in one leg that can begin in the buttock or behind the knee and extend to the thigh, ankle, or foot.
  - Weakness in certain muscles in one or both legs.
  - Pain in the front of the thigh.
  - Cauda equina syndrome
Diagnosis

Initial diagnosis of lumbar herniation generally is based on the symptoms of lower back pain. Your doctor will examine your sensation, reflexes, gait and strength. Your doctor also may suggest the following tests:

- **X-ray** -- High-energy radiation is used to take pictures of the spine.
- **Magnetic Resonance Imaging (MRI)** -- An MRI provides detailed pictures of the spine that are produced with a powerful magnet linked to a computer.
- **Computed Tomography (CT) Scan** -- A CT scan uses a thin X-ray beam that rotates around the spine area. A computer processes data to construct a three-dimensional, cross-sectional image.
- **Electromyography (EMG)** -- This test measures muscle response to nervous stimulation.
Diagnostic studies

- MRI is the test of choice for evaluation of disc disease. Its multiplanar capabilities make it suitable for visualizing far lateral disc herniation as well as the paravertebral structures.
Treatment

Conservative treatment of lower disc pain usually is successful over time.

It includes:

• Pain medication or pain therapies such as ultrasound, massage or transcutaneous electrical nerve stimulation
• Anti-inflammatory medication such as aspirin, ibuprofen and acetaminophen
• Physical therapy
• Steroid injections
• Education in proper stretching and posture
• Rest
Management of disc herniation

- **The medical management traditionally involves:**
- **Bed rest** and analgesics and anti-inflammatory drugs.
- **Muscle relaxants** help in some. Transcutaneous electrical nerve stimulation (TENS) helps in about 20% of patients.
- **Physical therapy** such as (exercise, relaxation, massage, and hot compressors).
Management of disc herniation

- **Surgical management:**

  Indications for surgery include failure of acceptable pain control by nonoperative measures, progressive neurological deficit. The traditional approach to lumbar discectomy (laminectomy) usually under general anesthesia.
THANK YOU FOR THE ATTENTION