

PBL team

med433



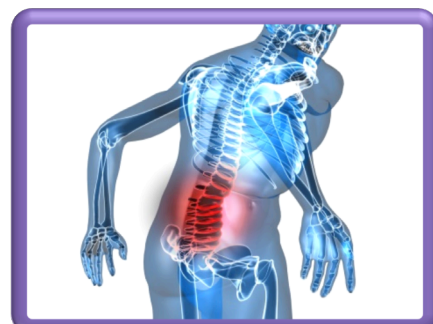
First case

The trouble with my back

Done by:

- Mohammed Albaz.
- Mohammed alnafisah
- Aisha Alraddadi.
- Awatif Alanzi.
- Aisha Alsafi.

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Key points from the Scenario:

- 38 years old male construction builder.
- Comes with back pain in lower part of his back.
- The pain interferes with his daily activity.
- Is increased by sudden movement on his trunk, also coughing, sneezing.
- He noticed pain in his left buttock, back of thigh, and **calf muscles**.
- The pain associated with **numbness** in outer area below the left knee, and outer toes.
- No change in his urination or bowel habit, no fever or rigor and no change in his appetite.
- He carrying a few heavy objects at work.
- **Paracetamol** tablets go his pain during short time a day.

Muscular examination:

- He puts his weight on the right leg. He is unable to flex his trunk forward.

Neurological examination:

- Straight leg - rising is restricted to only 30 degrees on the left side. Normal (up to 90 degrees) on the right side.
- Sensation: impaired sensation on the outer aspect of the left leg below the knee, lateral side of the dorsum of foot, and lateral 3 toes.
- Reflexes : normal except for left ankle is lost (**the ankle is supplied by S1**).

Investigations → results

- **Plain X-ray** of the lumbar spine → nothing significant was found.
- **CT-scan** of the lower back → Sagittal section CT scan shows mild bulge of the disc at L5/S1, there is no bone abnormality.
- **MRI-scan** of lower back → Sagittal section shows some prolapse of the disc at the level of L5/S1.

(The results appear in CT scan and MRI because the problem is in the soft tissue).

Diagnosis:

- Prolapse of disc (**herniated nucleus pulposus**)
.. also called (**Bulging** Disc).

Management:

- The doctor described to him (**NSAIDs**) and **Muscle relaxant**, also he asked him to keep active and walking.
- **No need for surgery.**

The vertebral column (disks between vertebrae) :

- ✓ The disks are protective shock-absorbing pads between the bones of the spine (vertebrae). Each disc consists of :
 - *Peripheral part, the annulus fibrosus, composed of fibrocartilage,
 - * Central part, the nucleus pulposus, a mass of gelatinous material.
- ✓ The heavy load that Salem carried caused a severe pressure of the discs located between the vertebrae. The pressure caused a part of one of the discs between the vertebrae to protrude from its place causing a little pressure on one of spinal nerve.
- ✓ The fifth lumbar vertebra is by far the most common site of spondylolysis and spondylolisthesis.

Factors that increase the risk of developing low back pain :

- 1) Smoking.
- 2) Obesity.
- 3) Old age.
- 4) Osteoporosis.
- 5) Physical strenuous work.
- 6) Anxiety.
- 7) Depression.

MRI	CT-scan	Plan x- ray
<p style="color: red;">Magnetic resonance imaging</p> <p>MRI scanners use strong magnetic fields and radio waves to form images of soft tissue and organs and any pathological change. MRI is in general a safe technique.</p>	<p style="color: red;">Computed tomography scan</p> <p>technology that use X-rays produce tomographic images (virtual 'slices'), showing what is inside without cutting it open, It is useful for diagnosis. And give more information than plan x-ray</p>	<p>Electromagnetic radiation to view a non-uniformly composed density. The density and composition of each area determines how much of the ray is absorbed.</p>

Questions:

- **Why the pain didn't go away (despite paracetamol) ?**
- Because paracetamol isn't a strong analgesic (Low potency).
- **Where do you think the level of Salem's problem?**
- L5/S1
- **How would you explain the changes in his left lower limb (numbness and tingling)?**
- Neurological condition:
 - Spinal nerve compression by the prolapsed disc leads to Inflammation of the spinal nerves supplying the muscles of his left lower limb.

New terms you should know:

- **Pain severity:** Degree of illness.
- **Numbness:** inability to feel anything or react normally in a particular part of the body due to anesthesia or injury ...etc.
- **Muscle tear:** partial or complete ruptures of the muscle tissue.
- **Calf muscles:** It is a group of muscle that made up of three muscles superficial in the posterior compartment of the lower leg: these are
 - Gastrocnemius
 - Soleus
 - Plantar.
- **Analgesic:** to reduce or relieve pain.
- **Antipyretic:** to reduce temperature in patient with fever.
- **COX:** Cyclooxygenase.
- **Bulge:** rounded swelling or protuberance that distorts the flat surface.
- **Myotome and Dermatome:** Spinal nerves have motor fibers and sensory fibers. The motor fibers innervate certain muscles, while the sensory fibers innervate certain areas of skin. A skin area innervated by the sensory fibers of a single nerve root is known as a **dermatome**. A group of muscles primarily innervated by the motor fibers of a single nerve root is known as a **myotome**.
- **Non-steroidal Anti-inflammatory Drugs (NSAIDs):** are a class of drugs that provides analgesic and antipyretic and anti-inflammatory effects.

The classification of NSAIDs is:

1. Non-selective drugs which inhibit the activity of both (COX-1) and (COX-2).
 2. Selective drugs inhibit (COX-2).
- e.g : aspirin: its strong anti-inflammatory drug (non-selective).

- **Paracetamol:** Paracetamol (**non-selective**) is used as a pain reliever (pain of back, joints and headache) and antipyretic. It known also as **acetaminophen**.

N.B: Its not appropriate medication for his condition isn't a strong anti-inflammatory drug.

N.B: We recommend revising the lectures that are related with anatomy of the back.