IN THE NAME OF GOD
Problem Case
A 66-year-old woman from Kerman with complaints of *Right thigh* and *buttock pain* after an IM injection that was done two months ago.
Present Illness

The patient is a 66-year-old woman, known case of hypertension who was relatively well till about two months prior to admission when she had an intramuscular injection due to buttock pain and after 5 days her pain intensified.
Present Illness

- Her pain was so severe that she was not able to walk anymore and she became wheelchair-bound.

- Over the past two months her symptoms got worse.

- The pain had no radiation to her leg and foot and did not respond to conservative managements such as NSAIDs.
Present Illness

- **No neurologic** symptoms
- The patient had **no weight loss**.
- She did **not** complain of **fever** and **chills**.
Past Medical Hx.:

- The patient had only a history of hypertension that was on treatment.
• **Drug Hx.:**
  Tab Amlodipine 5mg  PO daily  
  Tab Acetaminophen & Diclofenac PO  PRN

• **Personal/Social Hx.:** Nothing Significant

• **Family Hx.:** Had no point
PHYSICAL EXAMINATION

V/S:

BP: 140/90  PR: 80/min

RR: 18/min  T: 36.5 ºC orally
PHYSICAL EXAMINATION

- Head & Neck: Normal
- Chest examination:
  Lung sounds were normal. Heart exam was normal.
- Abdomen: There was no distention or tenderness, no hepatomegaly, no splenomegaly and ascites.
- Upper extremities: Normal
Right lower extremity:

- **Swelling** of the *right buttock* (gluteal region)
- *Hotness* with no erythema
- Moderate *tenderness* without fluctuation
- There was no tenderness or swelling in the anterior aspect of thigh.
- A *lymph node* measuring $1.5 \times 2$ cm was palpated in the right inguinal region.
PH/ EX

- **Hip extension** was **painful** without limitation of motion, but hip flexion normal.
- **Right Faber test was positive** but rolling test was normal.
- Active and passive **movements** of the **hip** was **painful**.
- There was **no** tenderness on the **sacroiliac joints**.
- There was **no** tenderness on the **greater trochanter**.
PH/EX

- SLR, reverse SLR was **negative**.
- Proximal Muscle power in lower extremities could not be evaluated due to pain.
- Distal muscle strength was **normal**.
- Sensory examination was **normal**.

- Left lower extremity: **normal**
PH/ EX

- 1 cm size difference (Right thigh > Left thigh)
- Arterial pulses were normal & symmetric in all four limbs.

- The patient had Cystocele.
Problem list

- Right lateral thigh & Buttock pain
- Limitation in Faber test and hip extension
- Induration without fluctuation in right buttock
- History of IM injection
- No fever or chills
- Inguinal lymph node
Differential Diagnosis

- Cellulitis
- Gluteal Abscess
- Hip joint involvement
- Periarticular disorder
- Lumbar spine disorder
- Psoas muscle disorder
- Infiltrative disorders
LABORATORY TEST

- WBC: 4900
- RBC: 5,550,000
- Hb: 11
- HCT: 37
- MCV: 66.7
- MCH: 19.8
- MCHC: 29.7
- Plat: 339,000
- ESR: 54
- CRP: Negative
- BS: 123
- Urea: 27
- Cr: 1.31
- U/A: Normal
- PTT: 37
- INR: 1
- PT: 12
LABORATORY TEST

- Na: 140
- K: 4.7
- Ca: 10.4
- P: 3.8
- ESR: 52
Sonography

- **No** evidence of *abscess* in gluteal area.
- **Soft issue swelling** is present.
- Heterogeneous mass in the right inguinal region with prominent vessels (26 × 14 mm) with the possibility of necrotic lymph nodes.

- Doppler Sonography: Venous flow was reduced, but there was **no evidence of venous obstruction**.
Chest ct scan

- Opacity in the left apical lung with tiny calcification causing loss of volume TB has to be R/O
- Fibrotic and nodular densities are seen in the posterior sub pleural portion of the superior segment of the RLL.
- Bilateral calcified hillar and aorto pulmonary window lymph node are seen.
- Aorta is calcified.
Problem list

- Right lateral thigh & Buttock pain
- Limitation in Faber test and hip extension
- Induration without fluctuation in right buttock
- History of IM injection
- No fever or chills
- Inguinal lymph node
- **Left apical fibrosis**
- **Anemia & increased ESR**
• **Infectious consultation was done.**

• Sputum smear for BK was **negative**.

• **Bronchoscopy was done.**
  – Mucosal erythema and bleeding tendency.
  – Anthracosis & perihilar collapse.
  – BAL was **negative** for tuberculosis.
Bronchial washing smear:

- Protienous background. Some bronchial epithelial cells. Some squamous epithelial cell. Some neutrophils.
- Few lymphocytes.
- Few foamy macrophages.
Evaluation of the adult with buttock pain
Differential diagnosis buttock & hip pain

- Trochanteric bursitis
- Hip osteoarthritis
- Meralgia paresthetica
- Osteonecrosis
- Occult hip fracture
- Infiltrative disorder (bone & soft tissue)
- Aortoiliac vascular occlusive disease
- Referred pain from the lumbosacral spine or sacroiliac joint
In most cases, a careful *history* and *physical examination* can determine the etiology.
- The **character** of the pain
- The **location**
- The **movements** and **positions** that reproduce the pain.
- The affect on **ambulation**

Can be used to distinguish the conditions affecting **soft tissues** from disorders affecting the **hip joint** and adjacent **bones**.
Pain patterns

- The *character* and *location* of pain is the *key element* in the D.D. of hip pain.

- Increased pain *after use* and improvement with rest is the hallmark:
  - structural joint problem (OA)

- *Constant pain*, especially *pain at night*:
  - Infectious
  - Inflammatory
  - Neoplastic process
Lateral hip pain aggravated by direct pressure:

- **Trochanteric bursitis** (classic pattern) (from mild morning pain and stiffness to intolerance to sleeping on the affected side.)

- **Direct involvement of the femur** (metastatic ca)
  
  Progressive pain that is aggravated by *direct pressure* and *weight bearing*.

- Thus older individuals with **weight loss, history of cancer**, ... may need radiographic testing.
Lateral hip pain with paresthesias and hypesthesias

- **Meralgia paresthetica** (classic pattern)
  That is *not* influenced by direct pressure, hip movement, or lower back movement.

- **Lumbar radiculopathy** (particularly L4 - L5)
Anterior hip or groin pain

Arthicular (Involvement of the hip joint)

1) A **gradual onset** of pain in association with variable degrees of impaired movement is consistent with OA.

2) A **acute onset** of groin pain and impairment of weight bearing includes:
   - osteonecrosis
   - occult fracture
   - acute synovitis
   - septic arthritis.
Anterior hip or groin pain

Nonarthritic

Anterior hip pain that *is neither aggravated by direct pressure nor repetitive flexion* of the hip suggest:

- Referred pain (L2-3)
- Inguinal hernia
- Lower abdominal pathology
Posterior (gluteal) hip pain

- It is most often a sign of:
  - Sacroiliac joint disease
  - Lumbar radiculopathy
  - Herpes zoster
  - Infiltrative disorder (bone & soft tissue)
  - Unusual presentation of the hip joint.

- These Patients often undergo extensive examination and radiographic testing of the back and hip in order to define a precise cause.
Lower anterior thigh pain

- Patients presenting with lower anterior thigh pain pose the greatest clinical challenge.

- **Hip joint**  (Primary disease)
- **The Upper femur**  (Primary and secondary lesions)
- **Stress fracture of the femoral neck**
- **Upper lumbar radiculopathy**

- Unless the pain can be reproduced by passive rotation (hip joint), by applying torque to the thigh (femur), or by maneuvers designed to elicit radicular symptoms (SLR), most patients with lower anterior thigh pain require specific radiographic procedures to define a precise cause.
Hip osteoarthritis

- Patients age over 40 years.
- The principal symptom is **groin pain**, exacerbated by activity and relieved by rest.
- Pain at rest and at night (advanced disease).

- **Pain** is aggravated by movement rather than by direct pressure.
- **Pain** and limitation of motion on internal rotation
- Morning stiffness (less than 30 to 60 minutes)
- **Flexion** less than 115 degrees
Meralgia paresthetica

- Symptoms range from numbness and tingling (hypesthesia) to burning pain (paresthesia) **over the upper outer thigh.**

- Pain referred **beyond** the upper outer thigh or pain accompanied by **impaired reflexes** or **muscular weakness** suggests either trochanteric bursitis or lumbar radiculopathy.
Osteonecrosis

- The most common symptom is *groin pain*, followed by *thigh* and *buttock pain*.
- *Weight-bearing* and *motion-induced pain* are seen in most cases.

- *Early diagnosis* is very important.
- The diagnosis is made *radiographically.*
Occult hip fracture

- **Nondisplaced** fracture of the femoral neck can be difficult to diagnose.

- It should be suspected in patients with:
  - Severe anterolateral *hip tenderness*
  - Severe pain with even *partial weight bearing*
  - Intolerance to *passive rotation* of the hip

- Routine hip x-rays can be *normal* in this setting; the patient must remain non-weight bearing if the diagnosis is suspected until **MRI** or serial examination of the hip rules out the diagnosis.
Aortoiliac vascular occlusive disease

- Patients with Leriche's syndrome may complain of buttock, hip, and, thigh claudication.
- The pain is often described as aching in nature and may be associated with weakness of the hip or thigh with walking.
- PH/EX:
  - Diminished pulses in the groin area bilaterally
  - Occasional bruits over the iliac and femoral arteries
  - Muscle atrophy
  - Slow wound healing in the legs

- The examination of the hip joint and soft tissues are essentially normal.
Referred pain
(from the lumbosacral spine or sacroiliac joint)

- The lower lumbar roots refer pain to the *gluteus* and *posterolateral thigh* areas.
- The sacroiliac joints refer pain to the *gluteal* area.

- Referred pain should be suspected whenever:
  - *Back symptoms* accompany the pain
  - The pain *extends past the knee*
  - *Paresthesias* or hypesthesias accompany the pain
  - The examination of the hip joint and soft tissues are *unremarkable*. 
EXAMINATION

- All significant diagnoses at the hip can affect ambulation.

- Thus, the first priority in examining the hip is:
  - The patient's gait
  - Tolerance of squatting
  - General ability to move
  - Next, the integrity of the hip joint is assessed:
    - Passive movement
    - Tolerance of the maneuver
    - Any endpoint stiffness.
Maneuvers assessing specific conditions

- Int. and ext. rotation
- Patrick test
- Palpation of the trochanteric bursa
- Sensation of the anterolateral thigh
- SLR
- Neurologic examination
- Palpation of the sacroiliac joint
- Palpation of pulses
CONFIRMATORY MANEUVERS AND PROCEDURES

- Radiography
- Weight bearing AP pelvis x-ray
- MRI
- Radionuclide bone scan
- Ultrasonography
- Local anesthetic block
- Hip aspiration
Pelvic MRI was done.
After *surgery consultation*, the patient underwent an open biopsy.

**Pathologic Findings:**

- *Chronic inflammatory process* (due to injection?) Congestion.

The patient was discharged with low-dose corticosteroid, analgesic & recommendations for follow-up.
History

- Patient came back after 2 months.
- She still had the same pain with less intensity.
- Hip claudication was still present.
- The patient was afebrile.
**PH/EX:**

- The knee had semiflexion in supine position.
- **Hip extension** was **painful**.

- **Swelling** and **induration** in the right buttock with old surgical scar.

- **Diffuse swelling** and **induration** (8-10cm) in the upper anterior thigh (below inguinal ligament) that was not tender.

- **Right Faber test** was **limited**.
PH/EX :

- The patient had **distal muscle weakness** in the right lower extremity.
- Decreased dorsiflexion (**drop foot**)
- Plantar flexion: **Normal**
- SLR Test: **Negative**
- Knee and Achilles reflex: **Normal**.
- Plantar reflex: **Downward**
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Sonography

- Abdominal ultrasound was normal.
- Soft tissue mass in the right thigh near the inguinal area.
- Several Hypoechoic lesions with diameters 8 to 10 mm were seen.
- There was a greater mass, diameter 8*19 in favor of a lymph node mass.
- Around the incision area (right gluteal), at least 2 Collections with irregular wall thickening diameter 16*10 mm were seen.
Problem list

- Swelling in the ant. upper thigh
- Foot drop
- Right lateral thigh & Buttock pain
- Limitation in Faber test and hip extension
- Induration without fluctuation in right buttock
- History of IM injection
- No fever or chills
- Inguinal lymph node
- Left apical fibrosis
- Anemia & increased ESR
• **Foot drop**
  • Lumbosacral plexopathy
  • Radiculopathy
  • Neuropathy
Lumbosacral plexus syndromes
Causes of lumbosacral plexopathy

- Diabetic amyotrophy
- Idiopathic lumbosacral radiculoplexus neuropathy
- Primary neoplastic invasion/compression
- Metastatic cancer
- Benign neoplasms
- Radiation plexopathy
- Ischemic plexopathy
- Retroperitoneal hematoma
- Arterial (pseudo) aneurysm
Causes of lumbosacral plexopathy

- Trauma
- Obstetric (antepartum, intrapartum, postpartum)
- Vasculitides
- Connective tissue disorders
- Sarcoidosis
- Amyloidosis
- Infection (HIV, EBV, CMV, varicella zoster, Lyme disease, syphilis)
- Abscess (tuberculosis, salmonella)
- Heroin injections
DIAGNOSTIC EVALUATION

The diagnostic evaluation includes:

- Electrodiagnostic studies
- Laboratory investigations
- Neuroimaging.
Laboratory investigations

- CBC
- Coagulation profile
- Hb A1C
- ESR
- CRP
- ANA
- ANCA
- ACE
- Serum protein electrophoresis with immunofixation
- anti-Ro and La
- Serologies for EBV, VZV, HIV, Lyme disease, and syphilis
- LP
  (infectious, malignancy)
**Neuroimaging**

- MRI
- Computed tomography (CT) were the most effective radiological method to investigate the lumbosacral plexus.

Gadolinium-enhancement can be helpful in certain instances, such as:

- Neoplasm
- Abscess
- Inflammation
- Postoperative changes
Biopsy

• Will depend on the suspected etiology.

• Image-guided needle biopsies of intra-abdominal and intrapelvic organs and tissues are the gold standard for suspected neoplasm or infiltrative processes.

• When the diagnosis remains elusive, there may be a role for fascicular biopsy of proximal and/or nerve roots.
More common causes of LSP

1- **Diabetic amyotrophy**
   - Occurs in patients with type 2 DM.
   - It is not a pure LSP.
   - It also affects the lumbosacral nerve roots and peripheral nerves.
The traditional features include:

- The **acute, asymmetric, focal** onset of pain followed by **weakness** involving the **proximal leg**, with associated **autonomic failure** and **weight loss**.

- Onset in the distal leg is not uncommon.

- The condition becomes more widespread and symmetric with time. **Progression occurs over months and is followed by partial recovery in most patients.**

- Thoracic and upper limb involvement (in a minority of patients).
2-Idiopathic lumbosacral radiculoplexus neuropathy

Is similar to diabetic amyotrophy with respect to its pathophysiology, clinical features, prognosis, and management.
3-Neoplastic invasion

- The LSP lies in close proximity to bone, multiple soft tissues, and organs and is susceptible to neoplastic invasion from nearby malignancy.

- The mechanisms include:
  - Direct extension of tumor (most frequent)
  - Meningeal dissemination
  - Secondary extension of tumor to the bone
  - Hematogenous spread
  - Lymphatic spread
  - Paraneoplastic phenomenon.
Neoplastic invasion of the lumbosacral plexus in **malignant** tumors:

- **Carcinoma** (colorectal, breast, lung, gastric, thyroid, renal, ureteral, bladder, testicular, penile, prostate, cervical, ovarian, uterine, vaginal, melanoma)
- **Lymphoma**
- **Sacral chordoma**
- **Sarcoma** (retroperitoneal and pelvic)
- **Malignant schwannoma**

LS plexopathies due to **benign** tumors:

(leiomyoma, neurofibromas, and plexiform lesions)
Within weeks to months, pain is usually followed by the development of progressive numbness, paresthesia, and weakness.

Weakness can proceed to focal paralysis such as:
- **Foot drop** (weakness of dorsiflexion)
- **Flail foot** (weakness of both dorsiflexion and plantar flexion)
- **Loss of hip flexion**
- **Loss of knee flexion/extension**.
Prognosis and management

- In general, the prognosis for patients with LSP due to tumor appears to be poor.
- The median survival from time of diagnosis was approximately six months (range 1 to 34 months).
- Response to therapy often differs according to the type of tumor, and lymphoma was the most responsive tumor in this series.
Infectious, inflammatory, and infiltrative causes

- Infectious or parainfectious causes of LSP include:
  - **Direct infection**
  - **Remote inflammatory effects** of infection

CMV and HIV are typically associated with pure radicular syndromes. They can rarely cause a lumbosacral radiculoneuropathy that is similar to diabetic amyotrophy electrophysiologically.

- In immunocompromised patients, a lumbosacral polyradiculoneuropathy has been observed with echovirus infection and EBV reactivation.
Infectious, inflammatory, and infiltrative causes

- **Local abscess** formation in the psoas muscles or nearby structures may lead to direct compressive effects on the lumbosacral plexus and subsequent LSP.

- **Tuberculosis** and **salmonella** infections, but other organisms should be considered.

- Image-guided percutaneous drainage with CT can be used for both the diagnosis and treatment of abscess.
Pelvic MRI
Tissue biopsy
Diagnosis
Sarcoma