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Enlarged Iliopsoas Bursa Compressing the Femoral Nerve Resulting in Femoral Mononeuropathy and Denervation Edema

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Abstract

Iliopsoas bursitis, although not rare, may manifest clinically as a detectable mass in the groin area. This condition has the potential to apply pressure on the adjacent femoral neurovascular bundle, leading to isolated mononeuropathy.

We present an uncommon case of femoral mononeuropathy in a 46-year-old female patient caused by an enlarged iliopsoas bursa. The case is noteworthy due to its rarity and the clinical and diagnostic challenges associated with assessing individuals with a groin mass, hip flexor weakness, and femoral nerve palsy.

Keywords

- femoral nerve
- femoral neuropathy
- bursitis

Introduction

The lumbar plexus–derived femoral nerve (L2–L4) innervates the hip flexors and knee extensors. It provides sensory innervation to the anterior and medial thighs, the medial lower leg, and the foot. Femoral mononeuropathy and denervation edema can result from direct injury, external compression, systemic illness, or iatrogenic causes. The iliopsoas bursa facilitates smooth hip motions by minimizing tendon–pelvic bone friction. It is typically asymptomatic, but its expansion due to inflammation can affect nearby anatomical structures, including the femoral nerve. This case report highlights femoral nerve compression secondary to an enlarged iliopsoas bursa.

Case Presentation

A 46-year-old woman presented to the orthopaedic outpatient clinic with insidious onset of left groin, thigh, and lower limb weakness over a 6-month period. There was no history of trauma or surgical intervention. On physical examination, she had a full, painless range of motion in the left hip. However, there was weakness (grade 4) of the left hip flexors, suggesting L2–L4 nerve root dysfunction. Differential diagnoses included lumbar canal stenosis, nerve root radiculopathy, or a pelvic tumor compressing the femoral nerve was considered.

Investigations

Lumbar canal stenosis and acute disc herniations causing lumbar nerve root radiculopathy were ruled out by an initial magnetic resonance imaging (MRI) of the lumbar spine. Mild multilevel degenerative lumbar disc changes were noted, which did not account for the patient's symptoms.

MRI of the pelvis and hips revealed an enlarged iliopsoas bursa at the hip joint level, which was hypointense on T1-weighted images and hyperintense on proton density–weighted fat-saturated images, without underlying iliopsoas tendinopathy (►**Fig. 1**). Altered signal intensity in the left thigh's hip flexor muscles, with edema involving the

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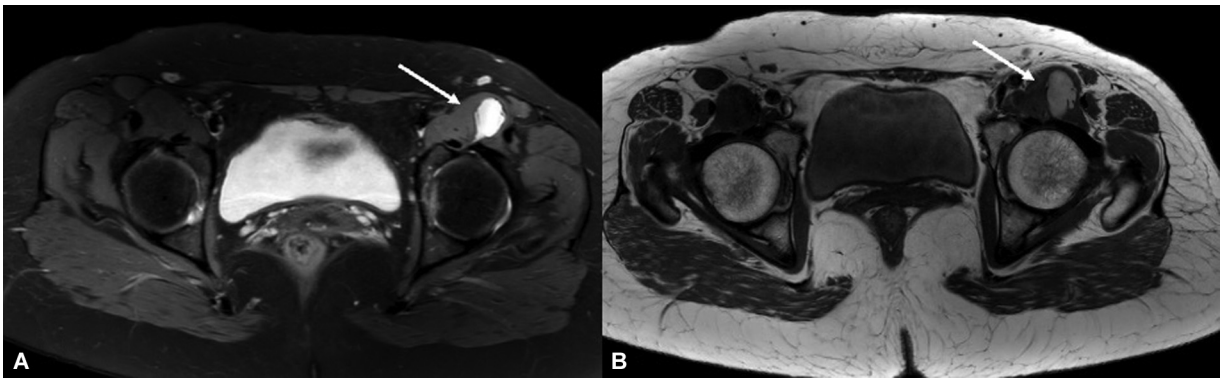

Fig. 1 Axial proton density fat-saturated (**A**) and T1W (**B**) images, showing enlarged left iliopsoas bursa (arrow). T1W, T1-weighted.

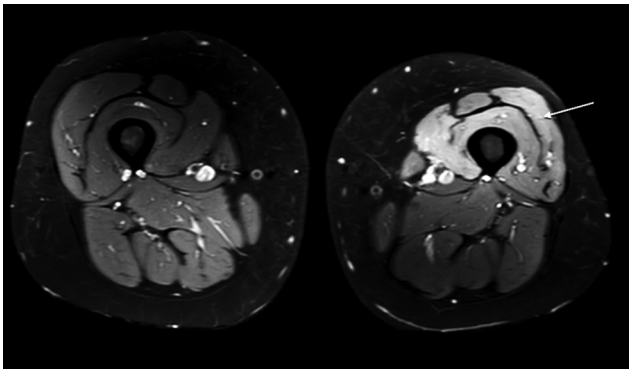

Fig. 2 Axial proton density fat-saturated image showing denervation edema of the left quadriceps muscle (arrow).

rectus femoris, vastus medialis, vastus intermedius, and vastus lateralis, suggested left femoral nerve denervation edema (►**Fig. 2**). The rest of the thigh and pelvic muscles were normal. Subsequent magnetic resonance neurography (MRN) showed that the enlarged iliopsoas bursa compressed the femoral nerve at the level of the hip joint, causing secondary denervation muscle edema (►**Fig. 3**). The bilateral hip joints showed no additional pathology. Myositis was not considered, as the muscle group with edema specifically correlated with the femoral nerve supply, making the edema pattern typical of denervation edema. No other abnormal mass lesions were noted within the pelvis.

Treatment Outcome and Follow-Up

Ultrasound-guided (USG) iliopsoas bursal aspiration and steroid injection were initially offered. However, due to the potential risk of recurrence or reformation of the bursa post-USG aspiration, the patient opted for definitive surgical treatment. An open surgical excision of the iliopsoas bursa was successfully performed to decompress the femoral nerve. The hip flexor tone and power improved immediately post-surgery, and the patient was discharged without complications. After receiving outpatient supportive care and physical therapy rehabilitation, the patient showed considerable improvement in symptoms and returned to work and daily activities after 1 month.

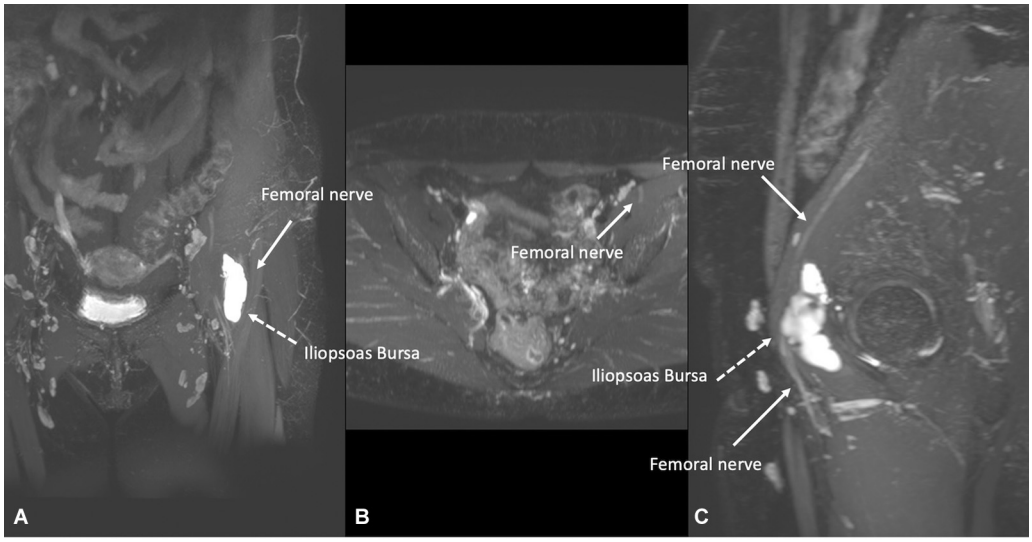

Fig. 3 Maximum intensity projection (MIP) of coronal MR neurography sequence (**A**), and MIP images of axial (**B**) and sagittal (**C**) multiplanar reconstructions, showing increased signal intensity of the left femoral nerve which is compressed by the left iliopsoas bursa (arrow). Axial image (b) also shows a normal signal of the right femoral nerve (arrow). MR, magnetic resonance.

Discussion

Femoral nerve compression secondary to an enlarged iliopsoas bursa is an uncommon but clinically significant condition. Despite the known anatomical proximity of the iliopsoas bursa to the femoral nerve, an iliopsoas bursa causing femoral nerve compression remains underexplored, with only approximately 20 instances of femoral nerve compression due to cystic lesions around the hip previously reported.

The femoral nerve is the largest branch of the lumbar plexus. After its formation by the dorsal divisions of L2–L4 lumbar spinal nerve roots beyond the lumbar neuroforamina, it descends between the psoas and iliacus muscles, passes below the inguinal ligament as the lateral-most structure in the femoral canal, and ultimately innervates the anterior compartment of the thigh via its anterior and posterior divisions. The nerve's path from the lumbar plexus through the pelvis and thigh makes it susceptible to direct external compression or injury at multiple locations (►**Fig. 4**, ►**Table 1**). Direct trauma, lumbar plexopathy, compressive lesions, infections, inflammatory conditions, ischemic, metabolic, and radiation damage may cause femoral nerve dysfunction. Understanding potential sites of nerve compression or injury aids in localizing the affecting pathology.

Diagnosis of femoral mononeuropathy involves a combination of clinical, electrophysiological, and imaging investigations. Clinical symptoms include anterior thigh discomfort, hip flexion and knee extension weakness, and sensory disturbances in the nerve's distribution area, including the saphenous nerve (medial aspect of the foot and lower leg). A positive Tinel sign and severe tenderness may be observed at the level of the femoral nerve exit from the Hunter canal, approximately 4 cm above the medial femoral epicondyle.

MRI helps visualize both the bursa and the femoral nerve, while ultrasound assesses the fluid content, size, and complexity of the iliopsoas bursa. Ultrasound and computed tomography may also be used for bursal aspirations and guided-steroid injections. High-resolution MRN provides better imaging of peripheral nerves and can validate clinical suspicion of femoral neuropathy, complement electrodiagnostic results, and rule out compressive mass lesions.[1–4]

The iliopsoas bursa was first described by Fricke in 1834. The iliopsoas bursa is a synovial fluid-filled sac between the iliopsoas muscle and the hip joint, potentially communicating with the joint. It is the largest synovial bursa in the body and cushions these structures during hip flexion and extension. A normal bursa maintains a steady size and fluid content, aiding hip joint and iliopsoas muscle function. Iliopsoas bursitis may be asymptomatic or present with hip stiffness, groin swelling, and pain, usually secondary to osteoarthritis, total hip arthroplasty, trauma, infection, or autoimmune diseases. An inflamed and expanded iliopsoas bursa could potentially impinge on the femoral nerve due to its proximity. Femoral nerve dysfunction is typically caused by mechanical compressive neuropathy or immune-mediated post-inflammatory neuritis.

Treatment decisions depend on the size, severity of symptoms, and underlying disease. Asymptomatic cases

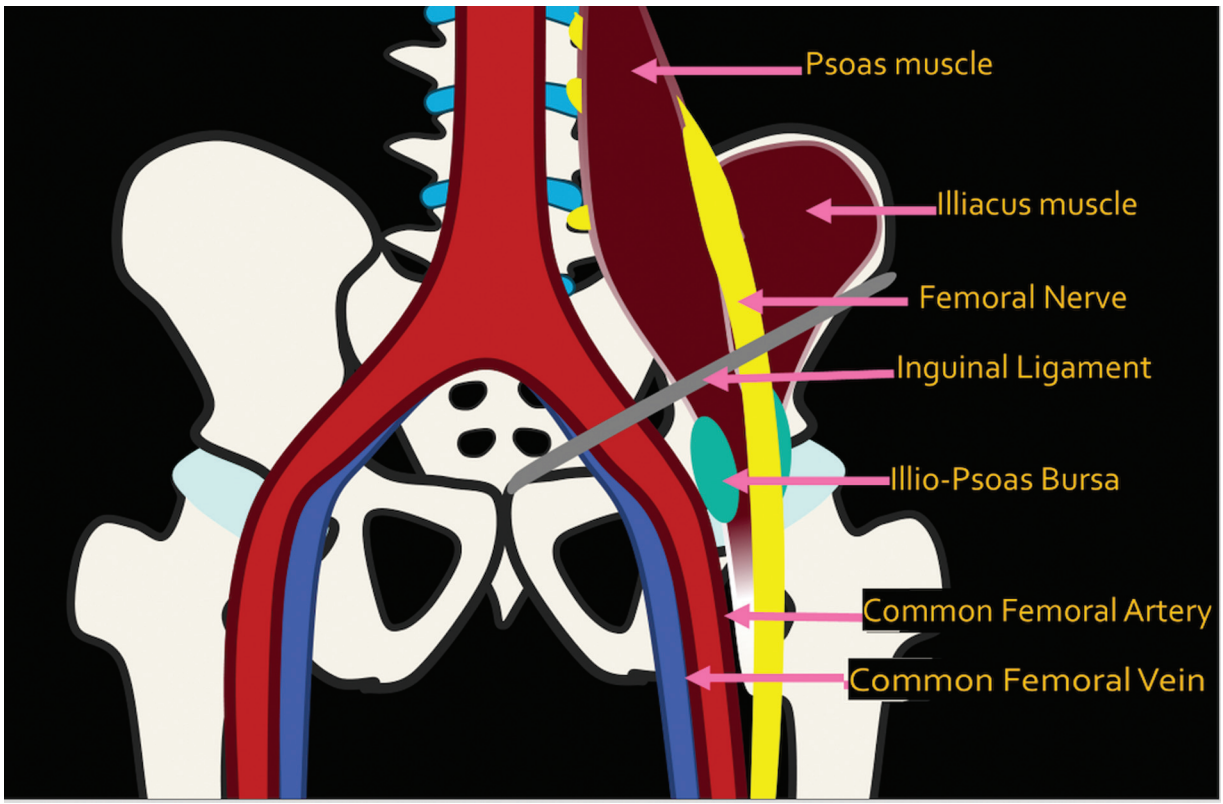

Fig. 4 Coronal schematic diaphragm showing course of femoral nerve at the level of the hip joints.

Table 1 Causes of femoral nerve pathology

Etiology	Pathology
1. Lumbar plexus and spinal roots (L2–L4)	• Compression or injury at this level can occur due to spinal disorders such as herniated discs, spinal stenosis, spondylolisthesis, lumbar tumor, and cysts.
2. Within the iliopsoas muscle:	• As the femoral nerve traverses the iliopsoas muscle, it can be compressed due to muscle hypertrophy, hematoma, or abscess within the muscle. • Inflammation or enlargement of the iliopsoas bursa, located beneath this muscle, is another potential site for nerve compression.
3. Inguinal ligament:	• The femoral nerve lies beneath the inguinal ligament. • Compression at this site can be caused by tight clothing, belts, or obesity, which increases pressure over the ligament. • This is also a site of vulnerability during surgical procedures in the pelvic region.
4. Pelvic and hip pathologies:	• Pelvic fractures, hip dislocations, or tumors can compress the nerve. • Postsurgical complications, such as after hip arthroplasty, can also lead to femoral nerve damage. • Enlargement of nearby structures, such as the lymph nodes or iliac vessels, can also exert pressure on the nerve.
5. Intraperitoneal and retroperitoneal space:	• Pathologies in the intraperitoneal or retroperitoneal space, such as tumors, hematomas, or aneurysms, can indirectly compress the femoral nerve by displacing adjacent structures.
6. Iatrogenic causes:	• Medical procedures in lower abdomen, pelvis, and upper thigh, like catheter placement, hernia repairs, and gynecological surgeries, can inadvertently damage the femoral nerve. • Additionally, injections in the wrong location can directly injure the femoral nerve.
7. Systemic conditions	• Diabetes or autoimmune diseases can lead to generalized nerve damage, including the femoral nerve. • In such cases, the nerve might be more susceptible to compression and injury due to underlying systemic neuropathy.

are treated with observation. The primary treatment for iliopsoas bursitis includes anti-inflammatory drugs, heat therapy, and physical therapy for symptomatic relief. USG corticosteroid and local anesthetic injections following aspiration are minimally invasive nonsurgical treatment options. Surgery is reserved for cases where conservative treatment fails, involving excision of the iliopsoas bursa and decompression of the femoral nerve.

Conclusion

This case report highlights iliopsoas bursitis as a potential differential diagnosis in patients presenting with lumbar radiculopathy and hip pathology. Clinicians should recognize potential sites of femoral nerve compression or injury to accurately identify the causative pathology, plan noninvasive or surgical procedures, and develop appropriate patient recovery and rehabilitation strategies.

Learning Points/Take-Home Messages

- Iliopsoas bursitis should be considered in the clinical differential diagnosis of lumbar radiculopathy and hip joint pathology.
- Diagnosis of femoral mononeuropathy should employ a combination of MRI, ultrasound, and electromyography to examine pelvic and thigh pathologies, the iliopsoas area, and femoral nerve function.
- High-resolution MR neurography examinations may validate clinical suspicion of femoral neuropathy, augment electrodiagnostic results, and rule out compressive mass lesions.

Patient Consent

Patient consent was obtained.

Funding

None.

Conflicts of Interest

None declared.

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