

Piriformis Injection in Pain Management

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ABSTRACT

Introduction: Piriformis syndrome is an uncommon cause of unilateral lower limb pain that is as a result of sciatic nerve compression by the piriformis muscle. Symptoms associated with this syndrome often make it difficult to distinguish it from several other conditions that lead to buttock, thigh or leg pain. Despite a number of clinical signs suggestive of a piriformis-myofascial disorder, not all patients present with the typical clinical features. This probably explains why it is frequently left undiagnosed. The piriformis injection should be considered when symptoms persist after attempts have been made with conservative methods. It is simple and fast and does not require a lot of needle manipulation. The technique for needle placement uses fluoroscopic guidance to inject the piriformis muscle with local anesthetic and can be used for both diagnostic and therapeutic purposes.

Keywords: Leg pain, Piriformis injection, Piriformis syndrome

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INTRODUCTION

Piriformis syndrome, an uncommon etiology of one-sided sciatic nerve pain is most often due to an abnormality in the piriformis muscle that compresses the sciatic nerve in the ipsilateral gluteal region. As a result, this anomaly may either be anatomical or pathological. Sciatic nerve compression causes pain, a tingling sensation and numbness in the buttock area, that radiates down to the thigh and leg.¹ Owing, the close resemblance of the clinical features with lumbar radiculopathy, sacral dysfunction, trochanteric bursitis and other symptoms, piriformis syndrome is often unrecognized or misdiagnosed in clinical settings. Currently, the lack of any specific diagnostic tests leaves diagnosing piriformis syndrome only possible by excluding all other likely causes of sciatic pain.² Still, it is important that timely diagnosis of piriformis syndrome is necessary to

avoid sciatic nerve pathologies, along with compensatory changes like hyperesthesia, paresthesia and muscle wasting. Moreover, surgical interventions like laminectomy due to misdiagnosis can be avoided.

Epidemiology

Due to the similar clinical features, piriformis syndrome has with several other conditions, and it is difficult to determine its exact prevalence. It is estimated that piriformis syndrome is associated with low back pain in 5 to 35% of people who present for care and it affects women more than in men, most probably due to a wider Q angle (Quadriceps femoris angle in the pelvis) in women. It is more common during fourth and fifth decade of life.³

Anatomy

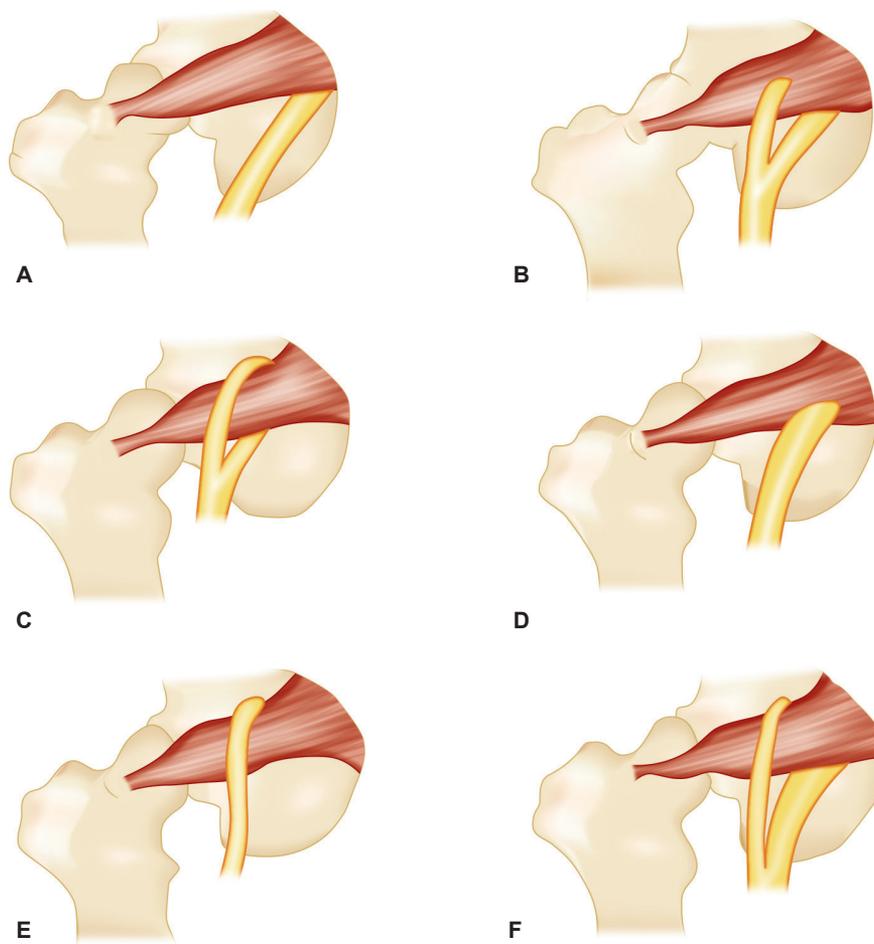
To understand piriformis syndrome, it is important to know about the anatomical presentation of the piriformis muscle and its variable relationship with the sciatic nerve. The piriformis is a pyramid-shaped flat muscle, which externally rotates, weakly flexes and weakly abducts the hip. In the flexed position, the piriformis helps in internal rotation and abduction of hip, whereas in the neutral position it helps in external rotation of the hip. It provides stability to a person when standing and walking and receives its nerve supply from both S1 and S2 spinal nerves.

The muscle has its origin from the anterior surface of the sacrum (mostly from S2 to S4 level) and ilium along with a capsule of sacroiliac joint. It passes through and occupies most of the greater sciatic foramen before it inserts at the superior border of the greater trochanter of the femur. Frequently, the sciatic nerve leaves the greater sciatic foramen, inferior and deep to the piriformis muscle. However, sometimes it may exit the foramen either above or through the belly of the piriformis. In these cases where the sciatic nerve leaves the foramen through the piriformis, it may pass completely or may split into two with one of the branch passing through piriformis. Piriformis syndrome is often common in populations with these kinds of anatomical variations. In (Fig. 1) images A and B show the most prevalent positions of the sciatic nerve in relation to the piriformis muscle.

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Figs 1A to F: Variant positions of the sciatic nerve in relation to the piriformis muscle

PIRIFORMIS INJECTION

Being a neuromuscular disorder with relatively few diagnostic tests, piriformis syndrome can be diagnosed by injecting local anesthetics into the piriformis muscle to treat the pain and provide symptomatic relief. This is especially so when the pain is suggestive of radiculopathy.^{4,5}

Indications for Piriformis Injection

Patients whose clinical condition does not improve, despite conservative management including physical therapy, piriformis stretching, muscle relaxants and treatment with non-steroidal anti-inflammatory drugs (NSAIDs) or other analgesics.⁶

Clinical Features

Symptoms

- Gluteal pain (97.9%)⁷
- Back pain and paraesthesia. Including similar symptoms in the groin, perineum, buttocks, hip, and back of the thigh (81.9%)⁷

- Pain in the calf area (59%)⁷
- Low back pain (18.1%)⁷
- Pain in the rectum during defecation and area of the coccyx
- Intense pain when sitting/squatting⁸

Cardinal Features

- H/O trauma to SI and buttock region
- Pain in the following region: Sacroiliac joint, the piriformis muscle, extending down the leg associated with difficulty in walking.
- Sudden sharp pain on stooping or lifting that is moderately relieved on stretching.
- A sausage-like swelling that is tender and can be felt over the piriformis.
- Positive lasague (straight leg test)
- Possible gluteal atrophy

Signs

- Tenderness in these regions: Sacroiliac joint and the piriformis muscle
- In the ipsilateral buttock a palpable mass

- Stretching the symptomatic limb provides moderate relief
- The asymmetric weakness of affected limb
- Medial rotation of affected leg is restricted
- Shorter leg of the affected side
- In chronic cases, there is buttock atrophy
- The sacrum is persistently rotated to the opposite side with a compensatory lumbar rotation

Physical Exam

- Trigger point tenderness—With the patient in Sims position, the gluteus muscle is relaxed, and the piriformis muscle is palpated at a point between middle third and the lateral third, in a line linking the greater sciatic foramen to the greater trochanter of the femur. Tenderness is observed in 59–92% of patients with piriformis syndrome.⁷⁻⁹
- Positive piriformis sign—Indicates a stiff external rotation of the affected lower limb is noted in 38.5% of patients.⁹
- Positive lasegue's sign—Painful active adduction, flexion and internal rotation of the affected limb.¹⁰
- Freiberg's sign—In a supine position, the patient's hip is internally rotated. This maneuver is painful in about 56.2% of patients probably as a result of passive stretching of the piriformis and thereby compressing the sciatic nerve on the sacrospinous ligament.^{7,8}
- Pace's sign—Abduction and external rotation of the ipsilateral thigh against resistance is painful and weak in about 46.5% of patients.^{7,8}
- Hughes test—The affected lower limb is externally rotated after maximal internal rotation, which is found to be painful.¹¹
- Beatty's maneuver—Patient is made to lie on the asymptomatic side and leg of the affected side is flexed and elevated. The patient feels pain deep in the buttock if piriformis is the pain generator, whereas back and leg pain in lumbar disk disease.^{12,13}

FLOUROANATOMY AND TECHNIQUE

For a fluoroscopic-guided piriformis injection, comfortably put the patient in a prone position. Maneuver the C-arm position to provide an anteroposterior view of the symptomatic side. Using a fluoroscopic image, identify the lower border of the SI joint, greater sciatic foramen, and greater trochanter of the femur.

The area of the affected side is the antiseptically prepared and draped, and the needle entry point is anesthetized with 1% lidocaine local anesthetic. An imaginary line between the top of the greater trochanter and the lower boundary of the ipsilateral sacroiliac joint is drawn, and at the midpoint, 2 cm above the acetabulum, a 15 cm

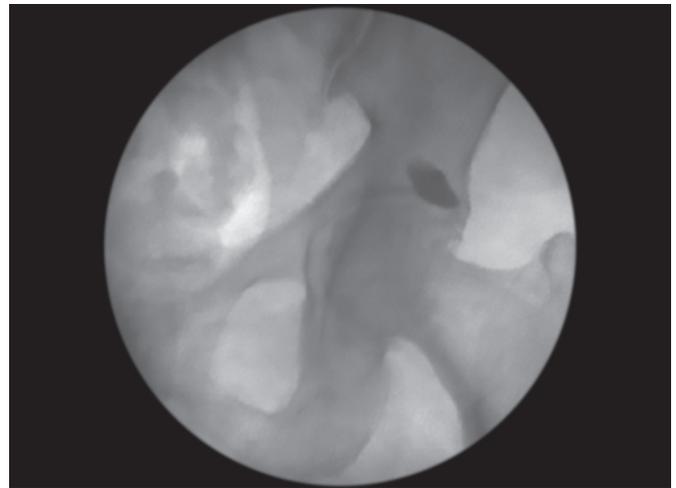


Fig. 2: Flouro image of the distal belly of the piriformis muscle

22 G quinke spinal needle is inserted in tunnel vision. The needle is advanced under fluoroscopic guidance until bone (ilium) is touched. The needle is then withdrawn by a half to 1 cm so that the tip of the needle lies within the belly of the piriformis; 1 to 2 milliliters of contrast media is injected to visualize a diagonal outline along the piriformis muscle (Fig. 2). Two percent lidocaine is then infiltrated into the muscle.

Contraindications

Absolute

- No consent
- Local or systemic infection
- Coagulopathy or patient taking anticoagulants without an adequate recommended drug-free period

Relative

- Uncooperative patient
- Drug allergy to any of the medication used in the procedure
- Unable to lie prone
- Severe cognitive dysfunction

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