Piriformis Syndrome

Diagnosis/Condition:	Piriformis Syndrome
Discipline:	DC, ND
ICD-10 Codes:	G57.00-03
Origination Date:	2000
Review/Revised Date:	04/2025
Next Review Date:	04/2027

Piriformis syndrome (PS) is an underdiagnosed but common condition caused by prolonged or excessive contraction of the piriformis muscle (PM). Because of the proximity to the sciatic nerve, PS is associated with pain in the buttocks, hips, and lower limbs. Yeoman (1928) was the first to describe pain in the sciatic distribution to PS. Many synonyms for the condition are used in the literature, such as "deep gluteal syndrome" and "pelvic outlet syndrome". Analogous to other entrapment neuropathies, such as carpal tunnel syndrome, this clinical picture can also be correctly termed "infrapiriform foramen syndrome".[1] It is estimated that at least 6% of patients who are diagnosed as having low back pain actually have piriformis syndrome. Reported incidence rates for piriformis syndrome among patients with low back pain vary widely, from 5% to 36%.[2] The piriformis muscle is primarily an external rotator of the hip that has its origin on the anterior surface and lateral aspects of the sacrum and the gluteal surface of ilium at the margin of the greater sciatic notch. The muscle traverses the greater sciatic foramen to insert on the superior border of greater trochanter. The sciatic nerve is usually deep to the piriformis, but anatomical variation is fairly common.[3,4]

The diagnosis of piriformis syndrome is complicated by the large differential diagnosis of low back and buttock pain with many diagnoses having overlapping symptoms. The clinical presentation is frequently confounded with radiculitis or referred pain from the lumbar spine, bursitis of the hip as well as deep gluteal syndrome which includes other types of non-discogenic sciatic nerve entrapments in the subgluteal space which can be classified as traumatic, iatrogenic, inflammatory/infectious, vascular, gynecologic, and tumors/pseudo-tumors.[5]

Clinical tests to confirm the diagnosis of piriformis syndrome are not reliable. Careful palpation may identify the source of pain and muscular dysfunction of the piriformis or other structures in the deep gluteal region.[6]

Proposed Causes of Piriformis Syndrome[7]

- Contracture or spasm of the piriformis muscle due to trauma in the hip or buttock area.[8]
- Piriformis muscle hypertrophy (often seen in athletes during periods of increased weightlifting requirements or pre-season conditioning).
- Overuse and sitting for prolonged periods (taxi drivers, office workers, bicycle riders).
- Anatomic anomalies:
    - Bipartite piriformis muscle.
    - Sciatic nerve course/branching variations with respect to the piriformis muscle
        - In >80% of the population, the sciatic nerve courses deep to and exits inferiorly to the piriformis muscle belly/tendon.[9]
        - Early (proximal) divisions of the sciatic nerve into its tibial and common peroneal components can predispose patients to piriformis syndrome, with these branches passing through and below the piriformis muscle or above and below the muscle.[10]

Subjective Findings and History

- The most common features of this entrapment disorder are buttock pain and pain into the posterior and/or lateral thigh, tenderness over the greater sciatic notch and piriformis, aggravation of the pain with sitting and with maneuvers that stretch the piriformis muscle, and at times referred symptoms along the course of the sciatic nerve.[11]
- May or may not be associated with trauma. "Wallet neuritis" caused by sitting while carrying a thick wallet in the back pocket.[12]
- Symptoms are often made worse by walking, climbing stairs, or performing squats or repetitive rotation on planted foot (raking, assembly line work).
- Frequently associated with joint dysfunction.
- In the majority of cases, PS occurs in middle-aged patients (mean age 38 yr.).
- Incidence higher in females (6:1).
- Infrequent cause of neuropathy.

Objective Findings[13]

- Muscle testing with resisted abduction and external rotation of hip and may increase pain (Pace test).[14]
- Abduction and external rotation of the hip are weaker on the affected side tested with the patient sitting and resist separating their legs.
- Passive medial rotation of hip elicits the symptoms (FAIR or Freiberg test).14
- The patient lies on the uninvolved side and abducts the involved thigh upward; this activates the ipsilateral piriformis muscle causing pain (Beatty maneuver).
- Postural evaluation: look for foot flare on involved side, overpronation, antalgic gait, leg length inequality.
- Orthopedic/neurologic examination:
    - Straight leg test (SLR) usually negative.14
    - Hibb's: may be positive.

    - Bonnet's Sign: positive.
    - Other orthopedic tests may be positive if piriformis syndrome is superimposed on a low back condition.
- Palpation for exquisite tenderness or hypertonicity in piriformis, tight hamstrings.
- Palpation may intensify radiating pain into the thigh.
- Range of motion may show decreased and painful active and passive internal hip rotation-and hip adduction, as well as painful flexion.14
- Joint play: examine motion of the entire kinetic chain from foot to spine for hypo and hypermobility.
- Rule out possible swelling due to deep venous thrombosis.

Special Tests

- Laboratory, electrodiagnostic studies, and diagnostic imaging can be used to rule out other common causes of symptoms but are rarely the first choice for diagnosis of PS.[15]
- MRI has been suggested to show displacement of the sciatic nerve, and is useful to rule out disc and vertebral pathology.[16] More recent evidence suggests MR imaging as the diagnostic procedure of choice, which may include more advanced procedures such as MR neurography.[14] Electrodiagnostic studies: Electromyography (EMG) may show conduction deficits of the sciatic nerve and be useful in differentiating piriformis syndrome from intervertebral disc herniation.[17]

Assessment

- History and physical exam. No definitive criteria exist for diagnosis.
- Differentiate piriformis syndrome from lumbar disc involvement, lumbar nerve root involvement, trochanteric bursitis and SIJ dysfunction.

Plan

Home Therapies:

- Ice and hydrotherapy.
- Lifestyle changes:
    - Focus on good posture, especially when sitting, driving or standing.
    - Decrease sitting time, change sitting or standing position.
    - Add padding/pillow.
    - Remove wallet from hip pocket.
    - Avoid pivoting on planted foot.
    - Exercise regularly to keep your muscles healthy.

Herbal Medicine (Western):

- Botanical supplementation to reduce inflammation: Curcuma longa (turmeric),[18,19] Capsicum annuum (cayenne), Arnica montana (arnica), Ruta graveolens (rue), Hypericum perforatum (St. John's wort), and Gaultheria procumebens (wintergreen).

Supplements and Nutrients:

- Nutritional supplementation (Vitamin C, manganese, magnesium, calcium, glucosamine sulfate, chondroitin, methylsulfonylmethane, bromelain,[20,21] and essential fatty acids.[22,23]
- Topical treatments (e.g., comfrey poultice, hypericum, arnica, wintergreen).

Pharmaceuticals (OTC):

- Nonsteroidal anti-inflammatory drugs (NSAIDS),

Pharmaceuticals (Prescription):

- Muscle relaxants.

Physical Modalities (Western):

- Physical therapy modalities to control inflammation and pain (including ultrasound and iontophoresis).[24]

Movement and Exercise:

- Hip muscle strengthening and re-education.[25]
- Home exercises: to stretch or strengthen piriformis and thigh muscles.

Soft Tissue Therapies:

- Myofascial therapy/massage therapy.

Manual Adjustments/Manipulation:

- Manipulation of lumbar spine, sacroiliac joint, and pelvis along with manual therapy/massage. [26]
- Kinetic chain manipulation from foot to spine.
- Correct overpronation and leg length inequality.

Acupuncture (excluding pharmocoacupture):

- Trigger-point (TrP) acupuncture.[27]

Injection Therapies:

- Radial extracorporeal shockwave therapy.[28]
- Corticosteroid injection.[29]
- A 2024 RCT (n=32) showed dry needling (DN) had a significantly greater peak extension angle of the hip during walking in individuals with piriformis syndrome than in the control group.[30]
- Neural therapy (local therapeutic anesthesia injections).[31,32]
- Ultrasound-guided platelet rich plasma injections.[33]
- There is fair quality of evidence to suggest botulinum toxin is safe to reduce pain in piriformis syndrome.[34]

- Trigger point injection (lidocaine hydrochloride).[35]
- Botulinum toxin type A (BTX-A).[36]

Outcomes Assessment Tools

- VAS/NRS
- Oswestry Disability Index
- Condition specific functional scale
- Sciatica Bothersomeness Scale

Length of Treatment

- Conservative therapy: 1-2 months, done as early as possible after symptoms occur.

Referral Criteria

- Referral after 1-2 months of care without symptomatic or functional improvement for other treatment or surgical decompression in chronic cases.[37,38]
- Although it may take longer to resolve, with treatment, improvement is often seen within 2 weeks.

Resources for Clinicians

University of Washington Department of Radiology. Piriformis. http://www.rad.washington.edu/academics/academic-sections/msk/muscle-atlas/lower-body/piriformis

M Klein. Physical Mediciane and Rehabilitation for Piriformis Syndrome. Medscape. Updated: Nov 9th, 2018. http://www.emedicine.com/pmr/TOPIC106.HTM

Resources for Patients

Maggs T. Piriformis syndrome. Spineuniverse.com. http://www.spineuniverse.com/displayarticle.php/article130.html

WebMD. Piriformis Syndrome. https://www.webmd.com/pain-management/guide/piriformis-syndrome-causes-symptoms-treatments#1

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