

Piriformis Syndrome

Dr Manju
RMT, BAMS

What is piriformis Syndrome?

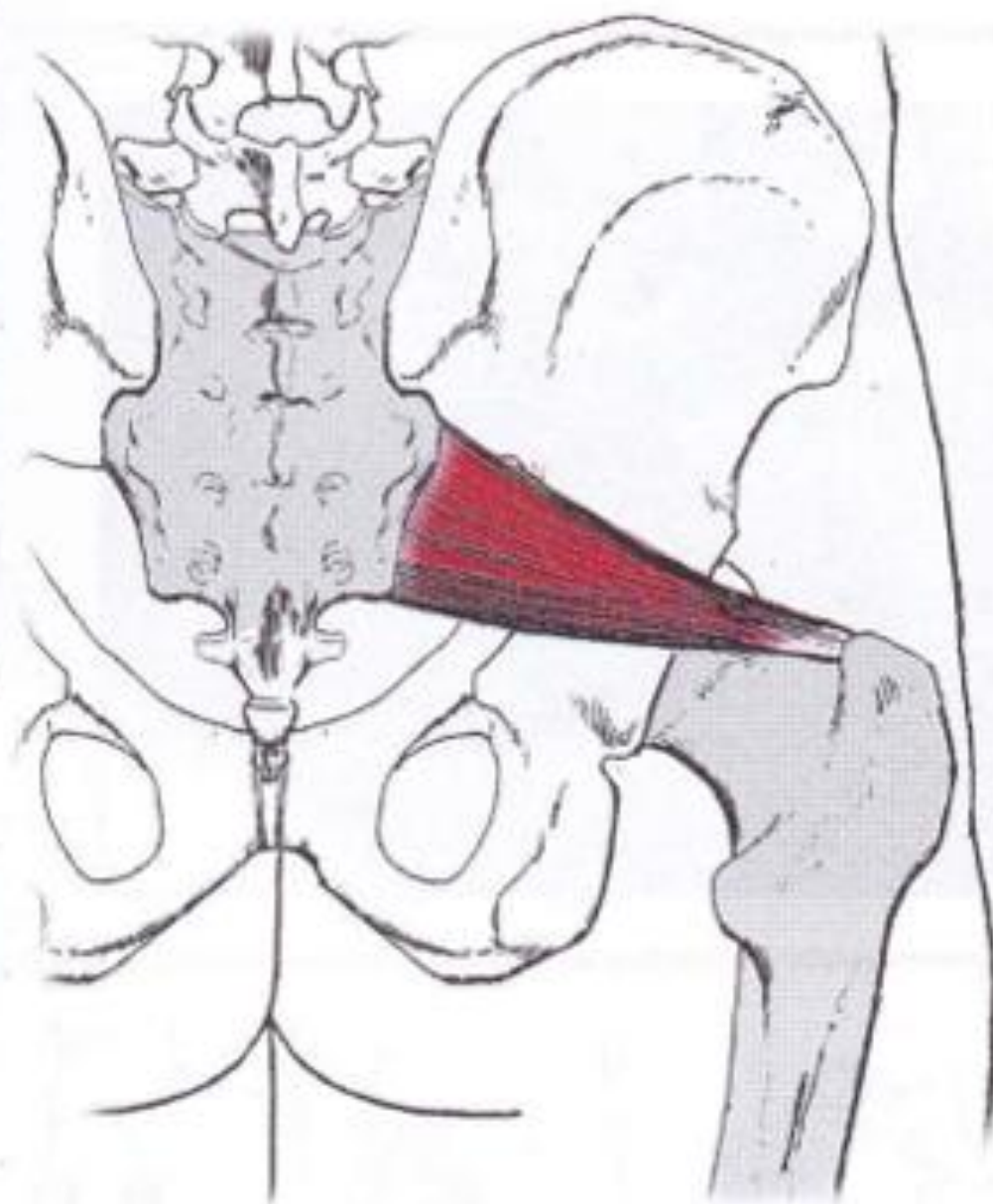
Piriformis syndrome is:

- Compression or irritation of the sciatic nerve by the piriformis muscle
- A peripheral nerve compression syndrome
- A common cause of buttock pain and sciatic-type symptoms
- Often referred to by the public as “sciatica”

Important:

- “Sciatica” is a symptom description, not a diagnosis.
- Sciatic symptoms may originate from:
 - Lumbar disc pathology
 - Nerve root compression
 - Piriformis trigger points
 - Piriformis muscle compression
 - Other entrapment sites along the sciatic nerve





- O** anterior sacrum (occasionally sacrotuberous ligament)
- I** greater trochanter (superiomedial surface)
- A** lateral rotation of hip
abduction of hip when thigh is flexed
- N** nerve to piriformis (L5, S1, S2)
- B** superior gluteal & inferior gluteal arteries
- S** gemellus superior & inferior, obturator internus & externus, quadratus femoris

The Piriformis Muscle Attachments

- Origin:
- Anterior surface of sacrum (S1–S4)
- Insertion:
- Medial superior aspect of the greater trochanter

Location

- Deep to gluteus maximus
- One of the lateral rotators of the hip
- Forms part of the greater sciatic foramen

Shape

- Pear-shaped muscle
- “Piriformis”:
 - Pirum = pear
 - Forma = shape



Functions of the Piriformis Muscle

- The piriformis:
- Externally rotates the femur when the hip is extended or neutral
- Horizontally abducts the thigh when the hip is flexed to 90°
- Internally rotates the femur when the hip is fully flexed
- Restrains rapid internal rotation during gait and running
- Helps stabilize the pelvis and hip joint
- Clinical relevance:
- Overuse and postural imbalance can overload the muscle
- Hypertonicity may compress the sciatic nerve



The Sciatic Nerve

Anatomy of the Sciatic Nerve

- **Nerve Roots**
- L4–S2 or S3
- **Components**
- The sciatic nerve contains:
- Tibial division
- Common peroneal division

Function

- Provides:
- Motor innervation to posterior thigh, lower leg, and foot
- Sensory innervation to most of the leg and foot

Pathway

- Exits through the greater sciatic foramen
- Usually passes inferior to piriformis
- Travels through posterior thigh



Anatomical Variations

Variations in Sciatic Nerve Pathway

- In approximately 10–20% of individuals:
- The sciatic nerve or peroneal division passes through the piriformis muscle
- The muscle may split into two bellies with the nerve travelling between them

Clinical significance:

- Increased susceptibility to nerve compression
- Symptoms may develop more easily
- Trigger points and muscle shortening increase compression risk



Pathophysiology

How Piriformis Syndrome Develops

- **Mechanism**
- Compression occurs when:
- Piriformis becomes tight, shortened, inflamed, or hypertrophied
- Sciatic nerve becomes compressed at the greater sciatic foramen

Contributing Factors

- Muscle spasm, Trigger points, Fascial restriction, Scar tissue, Edema, Ischemia, Joint dysfunction
- **Result**
- Neural irritation
- Pain referral
- Numbness and tingling
- Weakness
- Altered gait and posture



Piriformis Trigger Points

- **Common Locations**
- Lateral border of the sacrum
- One-third medial from greater trochanter
- **Referral Pattern**
- Pain may refer to:
- Sacroiliac region
- Buttock
- Hip joint
- Posterior Thigh
- Calf
- Sole of Foot



Clinical Effects of Trigger Points:

- Trigger points:
- Shorten the muscle
- Increase muscle bulk
- Compress the sciatic nerve
- Reproduce sciatic-type symptoms



Causes of Piriformis Syndrome

Structural/Anatomical

- Nerve passing through piriformis
- Variations in muscle structure

Trauma

- Fall on buttocks
- Motor vehicle accidents
- Side-impact collisions
- Slipping and sudden muscular contraction



Overuse

- Running
- Stair machines
- Repeated bending/lifting
- Squatting with load
- Forceful rotational activities
- **Postural Dysfunction**
- Hyperlordosis
- Hyperpronation/pes planus
- Prolonged sitting
- Sitting on a wallet
- Driving long distances
- **Pregnancy**
- Third trimester pelvic and postural changes



Who is at Risk?

- People with:
- Sedentary occupations
- Long driving hours
- Repetitive athletic activity
- Poor posture
- Hyperlordosis
- Sacroiliac dysfunction
- Pes planus
- Hip instability



Who is at Risk?

- Pregnancy
- Previous hip or lumbar injury
- Occupational examples:
 - Drivers
 - Office workers
 - Athletes
 - Massage therapists
 - Construction workers



Symptom:

Common Symptoms

- Buttock pain
- Radiating pain down posterior thigh
- Numbness and tingling
- Hip discomfort
- Low back pain
- Symptoms worsen with:
 - Sitting
 - Standing
 - Hip flexion
 - Adduction
 - Internal rotation

Symptoms often improve with:

- Hip external rotation



Additional Clinical Features

- **Possible Findings**
- Weakness in:
 - Hip abduction
 - Hip flexion
 - Internal rotation
- SI joint dysfunction
- Altered gait
- Pain during position changes
- Difficulty crossing legs



Palpation Findings

- Piriformis trigger points
- Gluteal trigger points
- Hypertonicity
- Tenderness at:
 - Piriformis
 - Greater sciatic foramen
- Fascial restrictions
- Scar tissue
- Swelling
- Possible gluteal hypotrophy



Range of Motion Testing Findings:

- **Active & Passive ROM**
- Reduced internal rotation
- Pain during internal rotation
- **Resisted Testing**
- Weakness
- Pain with piriformis contraction



Special Tests

Positive Tests

- **Pace Abduction Test**
- Pain or weakness during resisted abduction
- **Piriformis Length Test**
- Indicates shortened piriformis
- **SI Joint Motion Testing**
- May reveal restricted movement



Pace Abduction Test

- To assess the strength of piriformis muscle:
- Place the client in a seated position, with the hips in 90 degrees of flexion and the knees together.
- Instruct the client to place both hands on the lateral knees and apply resistance, holding the knees together.
- Then instruct the client to abduct the hips by pushing the knees apart against the resistance.
- Piriformis muscle weakness is a positive sign; pain indicates piriformis trigger points



Hibbs Test (Piriformis Test)

The Hibbs Test is an orthopedic test used to assess piriformis syndrome and pathology involving the hip external rotators.

Purpose:

- Detect piriformis muscle tightness or spasm
- Reproduce symptoms of piriformis syndrome
- Assess irritation of the sciatic nerve by the piriformis

Client Position

- Prone (lying face down)
- Knees flexed to 90°
- Therapist Procedure
- Flex both knees to 90°.
- Stabilize the pelvis.
- Passively move the lower leg outward, creating hip internal rotation.
- Compare both sides.



Positive Test

- Pain in the buttock region
- Reproduction of sciatic symptoms
- Restricted internal rotation compared with the opposite side
- Muscle spasm or tightness felt in the piriformis
- **Why It Is Positive**
- Hip internal rotation stretches the piriformis muscle. If the piriformis is shortened, inflamed, or compressing the sciatic nerve, stretching it reproduces the client's symptoms.

Interpretation

- A positive Hibbs Test may indicate:
- Piriformis syndrome
- Piriformis muscle contracture
- Tight deep lateral rotators of the hip
- Sciatic nerve entrapment by the piriformis



Differential Diagnosis of Radiating Buttock Pain

Condition	Key Symptoms	Pain Distribution	Positive Tests	Distinguishing Features
Lumbar Disc Herniation (Sciatica)	Numbness, tingling, radiating pain	L4: Medial calf L5: Dorsum of foot S1: Lateral foot & little toe	Valsalva, Kemp's, Kernig's, Slump, SLR (Lasègue's), altered DTRs	Weakness with toe walking (S1), heel walking (L5), or deep knee bends (L3-L4)
Piriformis Syndrome	Buttock pain with possible sciatic nerve irritation	Buttock → posterior thigh	Piriformis Length Test, FAIR Test, Freiberg's, Pace Test	Tender piriformis on palpation; neurological signs usually absent
Lumbar Spinal Stenosis	Progressive pain during walking	Usually bilateral calf and foot pain	Walking provokes symptoms	Symptoms relieved by sitting or lying down
Facet Joint Irritation	Local low back pain ± buttock referral	Buttock but rarely below knee	Kemp's Test	Piriformis palpation not painful
Inflammatory Arthritis (e.g., Ankylosing Spondylitis)	Chronic stiffness and pain	Often bilateral buttock pain	Medical imaging and laboratory tests	Morning stiffness; systemic inflammatory condition



Contraindications:

- Do not massage locally for 10 days after a cortisone injection.
- Avoid compression of the sciatic nerve when massaging the buttocks. This precaution is especially of concern when using the elbow at the lateral border of the sacrum. If the client experiences numbness and tingling down the leg to the foot, this could indicate compression of the nerve and the technique is stopped.
- Do not perform frictions if the client is on anti-inflammatories.
- Joint play, along with hip and sacral mobilizations, are avoided in the third trimester of pregnancy and performed with extreme caution with osteoarthritis or with a degenerative condition affecting the hip or sacrum.



Treatment Goals

Goals of Treatment

- Reduce sciatic nerve compression
- Decrease pain and muscle spasm
- Reduce trigger points and fascial restrictions
- Improve circulation and tissue health
- Maintain hip range of motion
- Address contributing postural factors
- Promote relaxation



- **Important Treatment Considerations**
- Identify the cause of sciatic nerve compression
- Massage may provide symptom relief but may not remove the underlying cause
- Most effective when caused by:
 - Piriformis hypertonicity
 - Trigger points
 - Postural dysfunction (e.g., hyperlordosis)
- Assess lumbar spine and entire pelvic girdle



Therapist Precautions

- **Safety First**
- Treatment may temporarily reproduce symptoms
- Symptoms should decrease as treatment progresses
- Avoid prolonged elbow pressure over the sciatic nerve
- If numbness or tingling increases, reduce pressure immediately
- Monitor client comfort throughout treatment



Client Positioning

- **Prone Position**

- Pillows for comfort
- Ankles elevated if edema present
- Hip maintained in neutral position

- **Side-Lying Position**

- Preferred during pregnancy
- Pillow between knees and thighs
- Maintain neutral hip alignment



- **Hydrotherapy**
- **Heat Applications**
 - Deep moist heat over buttock
 - Promotes relaxation and circulation
- **Cold Applications**
 - Used when edema is present
 - Helps decrease inflammation
- **Contrast Therapy**
 - Used after treatment
 - Enhances circulation and tissue recovery



syndrome.

Stretch tight, short muscles.

✍ The client ca

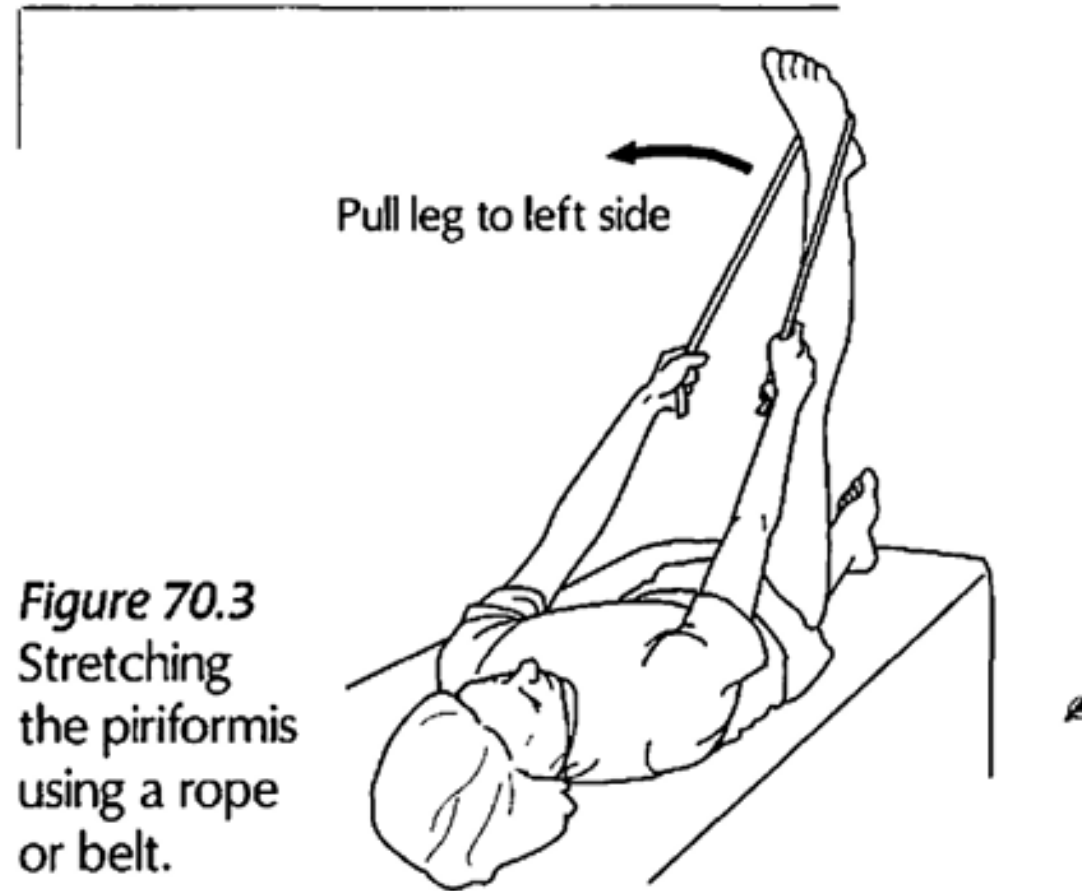


Figure 70.3
Stretching
the piriformis
using a rope
or belt.

