

# PIRIFORMIS (SMALL SCIATICA) SYNDROME

Lyn Paul Taylor, A.A., B.A., M.A., R.P.T.

(Editing Assistant and Computer Consultant: Joanna Soon, B.S.)

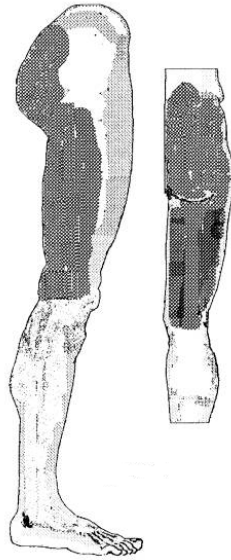
The *piriformis syndrome* is reputed by most to be a rare condition, arising from an *anatomical anomaly* or variation. The anomaly occurs when the tibial and common peroneal nerves arise separately while the posterior *femoral cutaneous nerve* (the small sciatic nerve) arises from the dorsal portions of S1 and S2 and ventral divisions of S2 and S3 in two separate parts. The dorsal portion passes *through the piriformis muscle* with the *common peroneal nerve*, branching to form gluteal and lateral femoral sensory nerves that innervate the cutaneous areas covering the lower and lateral portions of the gluteus maximus and the posterior and medial aspects of the thigh and popliteal fossa, respectively. The S1-S2 portion of the common peroneal nerve combines with the L4-L5 nerve roots to innervate the tibialis anterior, extensor digitorum longus, peroneus tertius and extensor hallucis longus muscles.

Should the piriformis muscle become *tonically shortened*, because of habitual external rotation of the hip (as during pregnancy), strenuous attempts to internally rotate the hip may result in the compression of the dorsal posterior femoral cutaneous and common peroneal nerves. Should this occur, a pain syndrome will immediately manifest itself that imitates, in some respects, the pain pattern and muscle weakness present in a *true sciatica* (sciatic nerve root compression at L4 to S1).

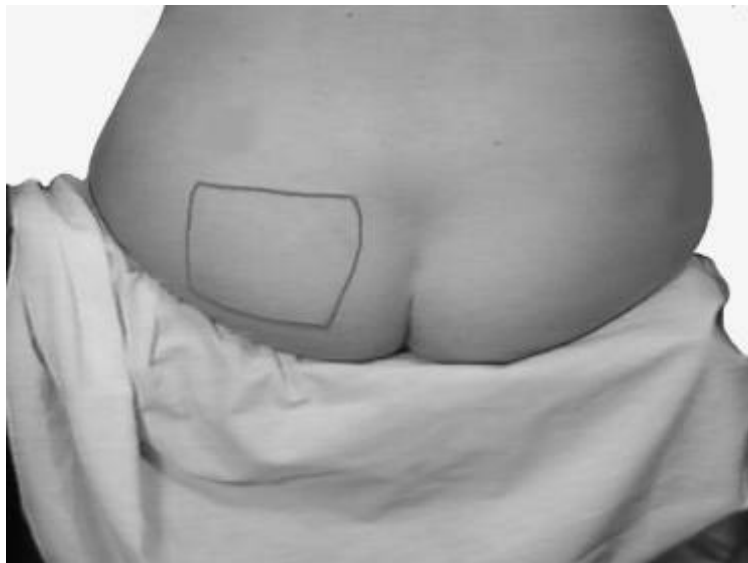
The subject will typically report a "deep and overwhelming pain" in the lumbosacral area with additional pain radiation following the distribution of the gluteal and lateral femoral sensory nerves over the lower and lateral portions of the gluteus maximus and the posterior and medial aspects of the thigh and popliteal fossa. Soft tissue inflammation may be present over the piriformis muscle (as demonstrated by *differential skin resistance survey*) and some soft tissue swelling may be present. The subject may complain of *weakness* of the *calf muscles* innervated by the *common peroneal nerve*, and even fasciculation of those muscles may be present. If the condition remains unrelieved for several days, trigger points may evolve homolaterally in the *gluteus medius* and *gluteus minimus* muscles, further complicating the pain patterns and the treatment regimen. The subject will typically find it difficult to stand, walk, or sit (especially on *hard surfaces*).

It should be noted that it has been found that, more commonly, *direct trauma* to the piriformis area (an external blow or unrelieved direct pressure into the area) may produce enough inflammation and swelling in the area to produce a syndrome that closely resembles the classic *piriformis syndrome, without nerve penetration of the piriformis*. In former times, this functional *piriformis syndrome* was called the "*wallet syndrome*" since it most frequently occurred to men who sat on their wallets.

To confirm the existence of a *piriformis syndrome*, the subject should be placed in a sitting position and the subject's involved leg should be manually *rotated internally* to the end of range; this maneuver should reproduce and magnify the subject's pain. The subject will also be *palpation tender* directly over the area of nerve compression. It has been noted that chronic sufferers will show a hollow or slight *dimpling* directly over the site most sensitive to probing (indicative of *adhesion formation* or tissue atrophy). Further objective evaluative evidence may be provided through *differential skin resistance survey*.



*The pain pattern normally described by sufferers of the Piriformis Syndrome (the darkened area represents the pain pattern)*



*The high skin resistance pattern (DSR zone) associated with the Piriformis Syndrome*

## Treatment

The general pattern of treatment of *piriformis syndrome* is to: (1) decrease piriformis hypertonicity, (2) reduce adhesions, (3) reduce inflammation, (4) increase circulation, and (5) increase piriformis muscle length.

### Application:

- A *DSR survey* should be performed to establish the existence of any *inflamed zones*.
- The inflamed zone should be electrically stimulated. The *electrical stimulator* should first be preset to deliver *wide-pulsed galvanic current* at six cycles per second (Hz) for a ten-minute period. The negative electrode should be placed over the inflamed zone (the piriformis) and the positive over an area in the low back, on the same side. The machine should be turned on and its amplitude gradually increased to produce visible “*bouncing*” contractions of the gluteus maximus and lower abdominal muscles.
- Following this stimulation, the electrical stimulation unit should then be preset to provide a *medium frequency waveform*, with a duty cycle of ten-seconds on and ten-seconds off. The electrodes should remain where they are. The stimulator should be turned on and the amplitude gradually increased until the subject reports *brisk maintained-contractions* of the muscles stimulated. The stimulation should continue for ten-minutes (refer to ELECTRICAL STIMULATION).
- The soft tissues in and around the inflamed zone should be *manipulated* to reduce any *adhesions* that are present (refer to SOFT TISSUE MANIPULATION).
- *Phonophoresis* of the inflamed zone, utilizing an effective anti-inflammatory as the coupling agent (*topical ibuprofen* is favorite), with the ultrasound unit set to deliver a *1 Mhz pulsed* waveform, at *1.5 W/cm<sup>2</sup>*, for six minutes (refer to INFLAMMATION CONTROL WITH ULTRAHIGH FREQUENCY SOUND).
- The *piriformis muscle* should be *mechanically vibrated* at 60 cycles per second (Hz) for two minutes (refer to VIBRATION).

If the physical *anomaly* discussed earlier in this article is suspected to be present, the subject should be instructed in the importance of habitually sitting with the hips internally rotated (knees together and feet splayed out), to establish tonically lengthened hip external rotators. The subject should also be instructed in the piriformis muscle lengthening isometric exercise (see below).

## **Trigger Points:**

The following *trigger point formations* may, singly or in combination, imitate or contribute to the pain associated with the *piriformis syndrome*: Multifidus (S4), Longissimus thoracis (T10-T11), Multifidus (S1-S2), Iliocostalis lumborum (L1), Caudal (lower) rectus abdominis, Gluteus minimus, and Gluteus medius.

## **Piriformis Muscle Lengthening Isometric Exercise**

***WARNING:*** While performing isometric exercise, the breath should not be held, under any circumstances. Holding the breath during exertion may provoke a Valsalva maneuver (a forced expiration against a closed glottis), which may cause tachycardia and a subsequent rise in blood pressure, followed by bradycardia and a sudden drop in blood pressure. Such shifts in heart rate and blood pressure may precipitate cardiac malfunction or a cerebral vascular accident. The Valsalva maneuver may be avoided by the simple procedure of counting the seconds out loud during exertion.

1. Sit erect, with the knees as close together and the feet as far from one another as is possible (internally rotating the hips and **lengthening** the hip external rotators).
2. Fasten a **non-stretchable belt** or other binding material snugly around the knees.
3. Push the knees out against the resistance of the belt for six seconds and then **relax for six seconds**.
4. Repeat the exercise 10 times (this constitutes “a set”).
5. A **set** of this exercise should be performed once or twice, daily.

## **References:**

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