

## PIRIFORMIS (SMALL SCIATICA) SYNDROME

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 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 down one leg. This pain follows 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 a DSR 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 may even complain of fasciculations of the muscles affected. If the condition remains unrelieved for several days, trigger points may evolve homolaterally in the **gluteus medius** and **gluteus minimus** muscles. This will further complicate 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.

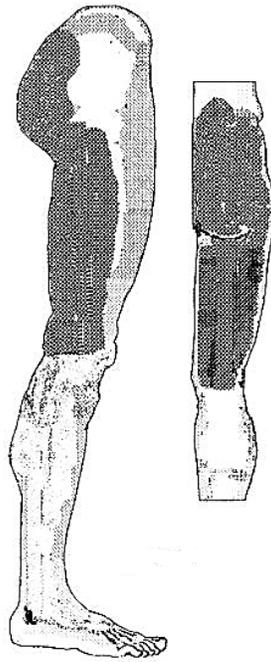
To confirm the existence of a *Piriformis Syndrome*, the subject should be placed in a sitting position and the subject's involved leg should be manually **rotated internally** to the end of range; this maneuver should reproduce and magnify the subject's pain. The subject will also be **palpation tender** 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 a DSR survey.

### Treatment

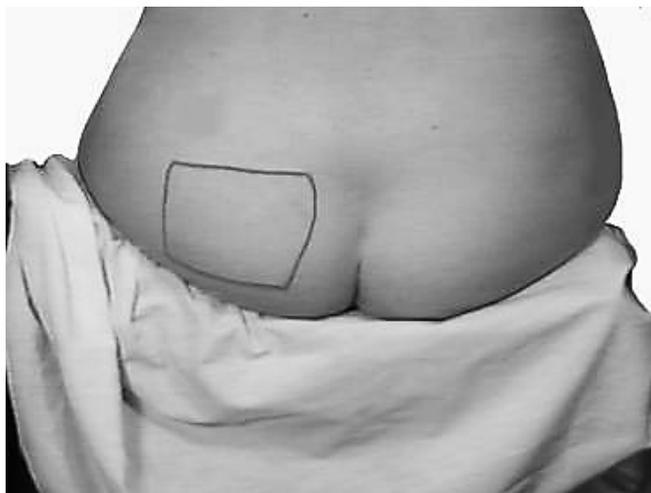
The general plan of treatment of the *Piriformis Syndrome* is to: (1) decrease piriformis hypertonicity, (2) reduce adhesions, (3) eliminate any inflammation, (4) increase circulation, and (5) increase piriformis muscle length (if deemed appropriate).

### Application:

- Preset an electrical stimulator to deliver a wide-pulsed galvanic current at six cycles per second (Hz). Place a negative electrode over the inflamed zone (the piriformis) and a positive over an area in the low back, on the same side. Turn the machine on and gradually increase the amplitude to produce visible "**bouncing**" contractions of the gluteus maximus and lower abdominal muscles. Stimulate for ten minutes.



**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**

- Then, set the electrical stimulation unit provide a medium frequency waveform, with a duty cycle of ten-seconds on and ten-seconds off. Leave the electrodes where they are. Turn the stimulator on and adjust the amplitude to produce near tetanic contractions of the muscles stimulated. Stimulate for ten minutes.
- Manipulate the soft tissues in and around the inflamed zone to reduce any adhesions that are present.
- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.5 W/cm<sup>2</sup>. Ultrasound the inflamed zone utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes.
- Apply mechanical vibration, delivered at 60 Hz, to the piriformis, for two minutes. Apply the vibration at a relatively high but tolerably comfortable level for the patient. This is performed to increase capillary circulation in the involved tissues.

***The following treatment form has also been effective.***

**Variation:**

- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.8 W/cm<sup>2</sup>. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This procedure is designed to soften the adhesions that may be present.
- Manipulate the tissues in and around the inflamed zone to eliminate any adhesions that may be present.
- Twenty minutes after the first ultrasound, preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.5 W/cm<sup>2</sup>. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This is performed to “cool off” the manipulated zone by effectively halting the production of prostaglandins by the stressed tissues.
- Apply mechanical vibration, delivered at 60 Hz, to the inflamed zone, for two minutes. Apply the vibration at a relatively high but tolerably comfortable level for the patient. This is performed to increase capillary circulation in the involved tissues.

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

- 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).
- Fasten a non-stretchable belt or other binding material snugly around the knees.
- Push the knees out against the resistance of the belt for six seconds and then relax for six seconds.
- Repeat the exercise 10 times.

**Post Treatment Suggestions:**

To help reinforce the habit of keeping the hip external rotators lengthened, assume the above sitting posture (without the belt) whenever sitting. Avoid crossing the legs at the knees or ankles (which reinforces the *shortening* of the hip external rotators).

The patient should only sit on **very soft** surfaces for two weeks. Absolutely **nothing** should be kept in the hip pocket.

### **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.