

How Piriformis Weakness Contributes to Sacroiliac Pain, Sciatica and Hip Dysfunction by Dr. Marc Heller

Here is a missing link in our treatment of chronic **SI joint** problems, chronic lumbar instability, hip problems and sciatica. What muscular weakness is missed in the common valgus knee pattern and foot pronation? Perhaps the missing piece is an effective way to rehab the lower pole of the sacral muscles. What if stretching the piriformis is really not enough -- and may be part of the problem, rather than part of the solution?

The piriformis gets a lot of interest. As chiropractors, most of us know that the piriformis is attached to the sacrum, not floating in space on its own. Since we are trained in joint manipulation, we tend to look at the joints attached to the piriformis, as well as the muscle and its fascia. I have always been skeptical of the term *piriformis syndrome*, which seems to imply that the tight piriformis is irritating the sciatic nerve.

First, let's use a broad-brush definition of the **piriformis**. From here on out, I will include use of the term *deep lateral rotators*. We are talking about the group of deep external rotators, including the piriformis, gemelli, quadratus femoris, obturator muscles, and the deep sacral fibers of the gluteus maximus. All of these muscles are associated with the lower part of the bony pelvis. Let's think of them and their function as a unit. The body thinks in movement patterns, not in individual muscles.

When I started this mini-series, which included my recent article on the superior cluneal nerves [Nov. 4 issue], I thought I was going to write about peripheral nerves and how to treat them. What I noticed was that treating the nerve is not necessarily the answer. When the superior cluneal nerve is a source of pain, it is best treated by a combination of manipulation to the thoracolumbar junction and fascial release to the paraspinal muscles of that region. I started this current article attempting to look at irritation of the middle cluneal nerves, which come from S1, S2 and S3, and supply the lower buttock. I realized that what was usually missing in correcting lower sacral problems was a simple rehab piece.



Strengthening the left piriformis. Have the patient lie on their side; their left leg should be almost straight, bent about 10-20 degrees. Support the bent right knee with pillows. Have the patient push their left knee into the table or floor, and then lift the left foot toward the ceiling, against gravity. Instruct them to move it as far as they can comfortably, without twisting their pelvis or hips. They should feel their lower buttock muscles activate/contract. Have the patient lower the leg slowly. Repeat the exercise 5-10 times for 2-3 sets. If needed, they can brace with their abdomen and/or activate the pelvic floor to enhance the exercise.

Let's go back to the biomechanics of the sacroiliac. Simply put, if the piriformis is weak and not functioning, it can be a major contributor to the frequent hypermobility that occurs in the sacroiliac mechanism. I appreciate the osteopathic model here, which looks at inner and outer sides of the joint separately. Perhaps the best way to think about this is that the iliosacral side functions in swing phase, non-weight-bearing, while the sacroiliac side functions while weight-bearing. (If this concept, and the

muscle energy view of the SI, are unfamiliar to you, review my previous articles on this topic.)¹⁻³ The most common pattern for an unstable iliosacral side of the joint is anterior rotation of the ilium on the right. These are easy to identify. The right ASIS is sagittally rotated anterior and appears inferior while supine relative to the left ASIS.

For the sacral side of the joint, the common pattern is a twist, with the left sacral base posterior. In the muscle energy osteopathic model, this is called a left on left, or we can call it left forward sacral torsion. Think of the sacrum twisting obliquely around an axis from the upper left to the lower right. The movement is occurring in the lower left pole of the sacrum (think left piriformis) and the upper right pole (think right multifidi). A chiropractor might call this an anterior inferior right sacral base, although I am rusty on chiropractic listing terminology.

There are two **muscle energy** patterns that look similar here: The left forward torsion and the left backward torsion both show a left posterior sacral base. The difference becomes clear when the prone patient extends and props up their upper body, leaving the pelvis on the table. If the unlevel sacral base becomes level, the patient has a left forward torsion. If the unlevel sacral base either stays unlevel or becomes even more unlevel, it means the sacral base cannot extend on L5, and you have a left backward torsion.

I have been using the stork, or Gillet test, to assess the SI for the past couple of years. I love it because it gives me a clear picture of what part of the SI is not moving. That said, I noticed that I was not finding left anterior torsions very often. The left anterior torsion is often described as sacrum vulgaris, the common sacrum, and is the most common SI pattern. I suspect I was missing this because the left forward torsion pattern is not really a fixation; the left sacroiliac side of the joint is not fixated, but the whole pelvic mechanism is hypermobile. In muscle energy, they think of it as a muscular problem, and describe the right piriformis as hypertonic. I suspect this is relative; that the inhibition of the left piriformis is the primary problem (shades of George Goodheart).

The right piriformis twists the right side of **the sacrum** forward. I think the left deep sacral muscles are needed to stabilize this, to prevent excessive motion. Visualize the sacrum moving at the left lower pole, controlled by the deep lateral rotators. Yes, there is misalignment, and yes, it can cause pain, but manipulating the joint has limited effect.

Three points here: 1) We should not be repetitively using high velocity on a hypermobile joint; 2) Even low-force methods, correcting the joint with muscle energy or other low-force mobilization over and over, are unlikely to solve the problem; and 3) Releasing the right (and/or left) piriformis is not going to be adequate to wake up the left piriformis. The key is to stabilize the joint that is moving too much by activating the inhibited muscles.

What does the average chiropractor do? Adjust the SI over and over. What does the average manual physical therapist do? Mobilize the "out of alignment" SI over and over. And we all teach the patient to stretch the tight piriformis. What if this is insane? I mean, are we doing the same thing over and over and expecting a different result? Why is an unstable SI so difficult to stabilize?

Here is a different approach, revisiting the deep lateral rotators from a different perspective. We know that the deeper, smaller muscles tend to get inhibited from pain. We know that all of these deep lateral rotator muscles are short and deep. But it is confusing. There are tight knots in the deep lateral rotators. Just as I would say for the psoas, the tight knots do not mean that the muscle is merely short, and just needs manual therapy and stretching. I would say that these muscles have timing delays and need to wake up.

If you evaluate the area between the lower sacrum and the ischial tuberosity, you may have several findings. It is likely to be tender to the touch. You may find knots or ropy areas. If you touch it with a broader touch, you will notice that the area often feels "gushy" or atrophied on one side, usually the left side.

If you muscle test the piriformis, especially the end range, it will often test weak. The end range or inner range is where a long and stretched muscle is likely to test weak. It never gets to function in that range. I like to muscle test the piriformis with the patient prone, starting with the bent lower leg adducted toward the opposite leg (you are externally rotating the hip), and then pulling the lower leg outward against the patient's resistance. Another test is to have the patient side-lying as pictured, and have them lift their foot. This will often feel weak to the patient; they will have a hard time lifting the foot.

When should we look for weakness or timing delays in the piriformis or deep lateral rotators? I've just described the chronic sacroiliac instability pattern above. Sciatica that is not classic and has a potential muscular component could occur with a weak piriformis. Another likely patient is one in whom the hip excessively internally rotates.⁴ The archetype might be younger women who pronate, whose knees point medially, and who tend to deviate into valgus knees under the stress of a lunge or a jump.

Sahrmann⁵ says the piriformis is more likely to be lengthened than shortened in these patients. The external rotators are failing to control hip internal rotation. Those of us trained in rehab are already looking at functionally training the gluteus medius for this group. The deep lateral rotators are another muscle group that may need a more isolated strengthening approach. I suspect that any hip problem needs some attention here, including patients who cannot internally rotate their hips.

This does not mean this is the only rehab the patient needs. When the left deep lateral rotators are weak, the right multifidi are likely to also be weak. You already know that the gluteus medius is related to this area. Your functional rehab principles will help here. I don't think this means we drop all stretching. I am suggesting that we question our previous assumptions.

The deep lateral rotator muscles are often found to be long and stretched in these patients. I suspect that manual therapy can be helpful here, but perhaps we need to reframe what we are doing. Perhaps, rather than releasing or getting additional length, our manual work needs to stimulate and wake up the muscle. Think of the FAKTR approach, treating the muscle dynamically as the patient moves. Think of what Graston technique or Stecco methods do.

Deep, intense work that stimulates first-stage healing has a **pro-inflammatory** component and increases fibroblastic activity. The sacrotuberous ligament is right underneath these muscles, and is part of what we are trying to stimulate. *Note:* Be careful here; if you treat too intensely and/or if the patient inflames too much, they won't be able to sit on their bottom for a few days.

Once again, I hope I have made you think and question your assumptions. Instead of thinking in terms of "He who dies with the most toys wins," I would say, "He who masters the most tools to help patients wins (or at least will die satisfied)."

References

1. Heller M. "Sacroiliac Mobilization, Part 1: Assessing for Fixation and Correcting Iliosacral Joints." *Dynamic Chiropractic*, **Nov. 4, 2010**.
2. Heller M. "The Sacral Side of the SI Joint: Correcting Anterior and Posterior Torsions." *Dynamic Chiropractic*, **Dec. 16, 2010**.
3. Heller M. "Still More on the Sacroiliac: Basic Principles and Two More Sacral Lesions." *Dynamic Chiropractic*, **Feb. 26, 2011**.
4. Heller M. "The Internally Rotating Hip." *Dynamic Chiropractic*, **July 29, 2009**.
5. Sahrmann S. *Diagnosis and Treatment of Movement Impairment Syndromes*. Mosby, 2002:138.