

Treating Piriformis Syndrome by Dr. Mark Cherrette

Evaluating your patient's gait can provide valuable information, especially in cases of slow response or other special situations. Many of the chronic or recurring cases of pelvic, hip or low back complaints are directly associated with gait imbalances. Take time to watch your patients walk around.

When patients don't respond to chiropractic care as expected, there is often an underlying collapse in the postural platform formed by the feet. [A 1999 study](#) found that "there are small, but important, intersegmental movements of the spine during gait."¹ Abnormal motion initiated by excessive or restricted joint interactions of the feet and lower extremities will eventually interfere with the normal intersegmental motions and lead to pain syndromes.

Locating the Origins of Pain

Specifically, I would like to discuss the common clinical findings of excessive foot flare, externally rotated femur, and piriformis muscle contracture. This triad of findings is often found in the patient with generalized hip and sacroiliac pain and dysfunction that may even include classic findings of sciatic nerve irritation. The same patient may enjoy temporary relief from symptoms following pelvic adjustments and/or the combination of stretching and massage. However, all too often, the underlying cause of the dysfunction is altered foot biomechanics, especially the hyperpronated foot.

When patients turn to chiropractic care for pain relief, few, if any, expect an area of their anatomy distant from the perceived pain to be at fault. However, in seven of 10 patients with back pain, [postural fatigue and spinal strain](#) cause their discomfort.² The ultimate cause of pain may originate in any tissue or joint involved in the kinetic structure. This is the exact scenario that, with time, produces the symptoms we are discussing.

As you observe your patient walking, take note of unilateral toeing out. Toe out is an adaptive muscular response to the biomechanics of hyperpronation (loss of medial longitudinal arch integrity) during stance phase, which accentuates walking with foot flare, which should normally be in the range of 10 to 20 degrees. Associated with excessive pronation and foot flare is marked wear along the lateral border of the heel. Excessive lateral heel wear is a good indicator of the chronicity and extent of the deformation. Excessive lateral heel wear also indicates the need to properly support the medial longitudinal arch.

The strength and function of the three natural arches of the foot depend upon the proper alignment of bones and the support of the ligamentous tissues – plantar fascia and bone-to-bone ligaments. The most common structural misalignment of the lower extremity is excessive pronation, affecting the medial arch primarily. Whenever there is compromise of the arch structures or the supporting soft tissues, the postural foundation is adversely affected.

In addition to the normal degrees of foot pronation during the stance phase of the gait cycle, there is a series of coupled motions that results in medial rotation of the entire lower limb and pelvis. With hyperpronation, this torquing is accentuated. The increased rotational forces are transmitted into the pelvis and hip region. One of the primary antagonists to this excessive medial rotation is the piriformis muscle.

Piriformis Syndrome

The piriformis has its origin on the second through fourth anterior segments of the sacrum and on the sacrotuberous ligament. The muscle travels anterior and inferior through the greater sciatic foramen as it passes superior and posterior to the femoral head. The muscle inserts on the greater trochanter, allowing the muscle to laterally rotate the thigh and assist in the tracking of the femoral head within the acetabulum.³

The following have been proposed as possible mechanisms by which irritation of the piriformis muscle leads to apparent or actual sciatic neuritis. First, in many cases, branches forming the sciatic nerve first pass through the belly of the piriformis muscle. Spasm and hypertrophy can physically irritate the nerve.⁴ Second, when irritated, the piriformis can release **inflammation byproducts** that have been shown to be chemical irritants.⁵

With the patient prone, efforts to place the thigh into internal rotation will be limited both by the contracture of the muscle and by reproduction of the patient's symptoms. Externally rotating the femur accentuates the subluxated position of the femur and should result in shortening of the reactive leg during functional leg checks.

Treatment involves contacting the posterior aspect of the greater trochanter and adjusting with an anterior and slightly inferior line of drive. However, the long-term solution is to remove the underlying irritation by the use of custom-made, stabilizing orthotics to support the three arches in each foot and absorb the shock of the foot striking the ground – both of which help to facilitate neuromuscular control for coordinated gait with each step.

Our discussion of hyperpronation leading to a piriformis syndrome is only one example of the possible consequences of poorly supported arches. Remember that excessive motion in the feet will irritate the weak links farther up the kinetic chain. A custom-made orthotic will help your patient's feet adapt to their environment, regardless of the circumstances.

Support and Shock Reduction: The Role of Orthotics

Not only does the orthotic support the arches of the foot, but it also reduces the transmission of shock into the spine. Pathological shock occurs when normal walking on hard surfaces exacerbates irritated structures. Force generated at heel strike can reach five to seven times body weight, with the musculoskeletal system itself absorbing a significant percentage of the total (under normal conditions).⁶ Specially designed orthotics contain unique viscoelastic materials to absorb a considerable amount of shock at the heel.

Chiropractic adjustments of the spine improve proprioceptive input by normalizing joint alignment and muscle tonus. Furthermore, because the feet contain approximately one-quarter of all the body's joints and, therefore, a concentration of proprioceptive fibers, it becomes logical to conclude that support of the postural foundation using custom-made orthotics will enhance the balance of our patients who need it most. In fact, this was the basis for **research involving custom-made orthotics** published in the *Journal of Manipulative and Physiological Therapeutics*.⁷

Obviously, not every patient is a candidate for orthotic therapy; but nearly all patients over the age of 40 can benefit from using orthotics.⁸ By this time, the effects of walking and standing on hard surfaces, ligament laxity (age-related or postpartum) and repetitive microtraumas have often contributed to significant plastic deformation in the feet. Prescribing custom-made, stabilizing orthotics provides highly dynamic and adaptive responses for an increased level of mobility and stability. If you are watching your patients come and go from your office, you'll know when they need it.

References

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