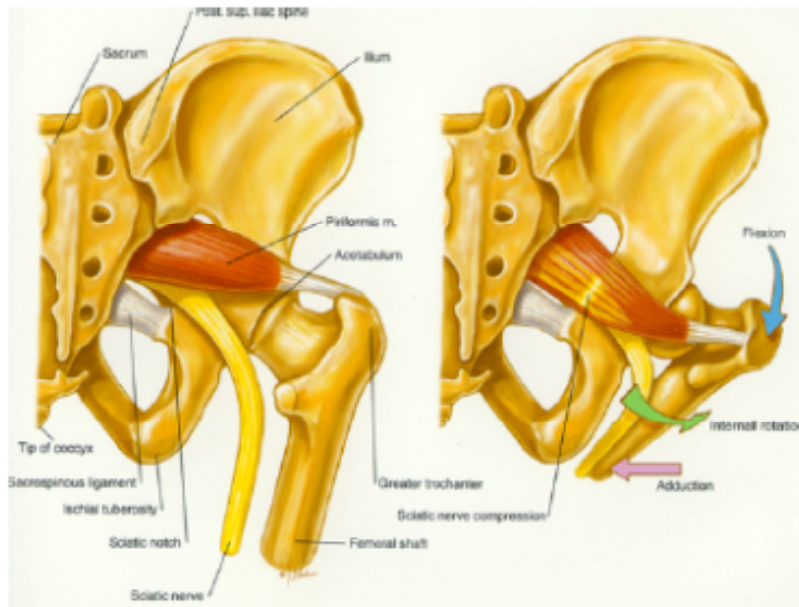


The Piriformis Muscle Syndrome

Anatomy and Physiology



The flat, pyramid-shaped piriformis is a postural muscle that lies deep to the gluteal muscles. It originates from the anterior sacrum between the 1st, 2nd, 3rd and 4th foramina, from grooves leading from these foramina, from the greater sciatic foramen and from the anterior surface of the sacrotuberous ligaments. After passing laterally through the greater sciatic foramen, it inserts via a tendon into the superior border of the greater trochanter of the femur. It is innervated by branches of the 2nd sacral, and sometimes of the 1st sacral and 5th lumbar nerves (1).

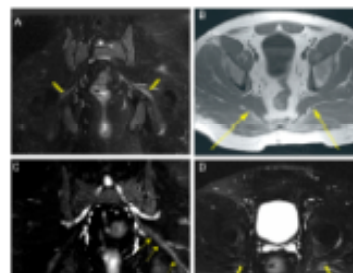


If the sacrum is fixed, the piriformis abducts and externally rotates the femur. If the femur is fixed, it contributes to retroversion of the pelvis on bilateral contraction or to medial rotation of the pelvis on unilateral contraction (2).

Symptoms

Like the nearby gluteus medius muscle, there appears to be a link between chronic muscle contracture of the piriformis and emotional stress, but the mechanism is as yet unknown. Upledger (1) takes the opposite view. Because the contracted piriformis chronically drags the sacrum towards the hip, the craniosacral system becomes compromised, thus explaining the general malaise and personality changes that frequently accompany piriformis problems. By shortening unilaterally, the piriformis can cause SIJ dysfunction. Bourdillon (3) suggests that recurrent SIJ problems will not stabilise until a hypertonic piriformis is corrected. Another pathway for referred pain is across the buttock to the hip and lateral leg.

When the piriformis shortens, its diameter increases. This allows for direct pressure, particularly in the sciatic foramen, to be exerted on the sciatic nerve which passes under it in most people. But, in about 15% of the population, the nerve passes through the muscle which makes them even more susceptible to sciatic symptoms of pain or paraesthesia in the buttock, sometimes extending into the posterior leg or rising into the lumbar region. In the external



rotation of the upper leg and flexion of the knee in sitting or squatting, these symptoms may become intense.

Because many of the muscles of the posterior thigh, the anterior and posterior leg and foot are innervated by the sciatic nerve, when it gets compressed by the piriformis, bizarre symptoms may occur. Chaitow (3) notes that compression of the pudendal nerve and blood vessels which pass through the greater sciatic foramen might be due to piriformis contracture. The impaired circulation in the genitals could cause pain when women externally rotate their hips during coitus or impotency in men.

Diagnosis



After eliminating spinal causes for the symptoms, examine the supine patient. Notice if there is external rotation of the upper leg and shortening of the leg on the affected side. Then, place the foot of the affected side lateral to the other knee. Resisted abduction may reproduce the symptoms. (This method can be used as an MET treatment.)

Straight leg raising is usually negative but, if it is positive, external rotate the hip at the same time to elicit the effect. Often, the relief of symptoms can be obtained by traction on the involved leg, particularly by pulling upward at about 20 degrees and towards the contralateral side by about 20 degrees.



Another stretch to elicit symptoms is to flex the hip and knee of the affected side and grasp the knee pulling it toward the opposite shoulder. This will adduct and flex the affected hip. The lower leg can be laterally rotated by grasping just above the ankle of the affected side with your other hand. This stretch can also be used as an exercise to self-treat a piriformis contracture by bringing the upper leg more across the body and holding for at least 90 seconds.

Beatty (4) gives a compression test. The patient side-lies with the affected side up. The knee is flexed and resting on the couch. The patient lifts and holds it a few inches off the couch to check if buttock pain is produced.

Travell (5) divides the muscle into thirds and palpates for painful trigger points that elicit symptoms. The medial portion may refer pain to the buttock and ischium, but does not refer pain down the leg like the gluteus medius. The main trigger is in the lateral third near the greater tuberosity which may refer pain to the buttock and posterior thigh. It is equivalent to the acupuncture point GB30. A rough way of finding it is with the patient side-lying with flexed hips and knees. Make a loose fist by placing the knuckle of your little finger on top of the greater trochanter. If you roll the fist downward, your thumb will fall into the depression that is this trigger point.

A Method of Treatment

In the first stage of TePooten's treatment (6), the patient lies on his side with the affected side up and knees bent. Your elbow or thumb is on the musculotendinous junction of the piriformis with a pressure of about 30 lb, while your other hand abducts the foot to internally rotate the upper leg. Repeat 3 times.



In the second stage, the patient lies supine with both legs extended. You flex the knee and the hip by grasping the foot of the affected leg and turn it inwards to externally rotate the upper leg. You then extend the patient's leg and turn it

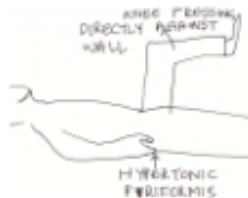
outward to internally rotate the upper leg. Repeat 3 times.

MET can be introduced by asking the patient to try to isokinetically resist both sets of movements.

In Chaitow's (3) variation, inhibitory pressure is introduced for 7 seconds then eased and the patient is asked to isometrically contract the piriformis by bringing the lower leg towards the table against resistance. After taking the leg to its new resistance, repeat twice more.

Alternatively, by manipulating the temporal sutures, the piriformis contraction can be released cranially.

Exercises



1/ Lie on the floor with the non-affected side parallel to a wall. Flex the good leg at the hip and the knee and, at the same time, palpate the tight piriformis on the other side for tissue change. Then press the knee of the non-affected side against the wall laterally until relaxation is felt in the tight piriformis. Repeat the exercise at least 3 times daily for days or weeks until the symptoms disappear (1).

2/ Sit upright on a kitchen-type chair or on the floor. Put the ankle of the affected side just above the knee of the non-affected side and lean forward for 90 seconds.



3/ Put the knee of the affected side on the ground in line with the shoulder of the non-affected side. The foot of the affected side should be just in front of the knee of the non-affected side. Press your hips towards the ground so that your body weight is on the affected leg.



As you move down, the knee of the affected side approximates the shoulder of the unaffected side. Hold for at least 30 seconds.

This is one way to approach piriformis dysfunction. You probably have your own methods that provide good results. Why don't you email with your favourite ways of diagnosis, treatment and exercise? Then we can get some discussion and interaction going in DOCNews.

References

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Diagrams and radiology courtesy of The Neurography Institute and SportsWeb

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