

Piriformis Syndrome: Part I

Warren Hammer, MS, DC, DABCO

The patient with an unrelenting sciatica may be suffering with a piriformis syndrome. This syndrome is considered an entrapment neuropathy caused by pressure on the sciatic nerve by an enlarged or inflamed piriformis muscle. The sciatic nerve can be compressed between the swollen muscle fibers and the bony pelvis.¹ Pace and Nagle² estimated that 45 of 750 cases referred to their back clinic were treated for this syndrome. They found that the condition was six times more prevalent in women than men. Because this syndrome is not common it is often overlooked and needless surgery may result.

Wyant³ states that the functional test for piriformis syndrome should be a routine part of the physical examination of all patients presenting with lower spinal backache. Besides backache, the piriformis muscle contracture and associated adhesions has been related to radiating pain from the sacrum to the hip joint over the gluteal region to the posterior thigh, coccydynia,⁴ dyspareunia, male impotency⁵, and oblique axis rotation of the sacrum with its effect on the total spine up to the atlanto-occipital region.⁵

According to Gray⁶ and Freiberg⁷ the piriformis arises from the anterior sacrum between the second to fourth anterior sacral foramina, from the margin of the greater sciatic foramen and from the anterior surface of the sacrotuberous ligament, the anterior sacrospinous ligament and the capsule of the sacroiliac joint. Freiberg states that the piriformis is the only muscle that bridges the sacroiliac joint. The piriformis passes through the greater sciatic foramen (the upper part of which it fills) and inserts by a rounded tendon into the upper border of the greater trochanter.

Pecian⁸ examined 130 human specimens to determine the anatomical relations of the sciatic nerve and the piriformis. He found that in 6.15 percent of the cases the peroneal part of the sciatic nerve passes between the tendinous parts of the piriformis and a pinching of the nerve can occur. He found at least five other variations of the sciatic nerve in relation to the piriformis muscle. He concluded that when the nerve passed between the tendinous portion of the piriformis the nerve would more likely be pinched during passive medial rotation of the thigh which stretches the piriformis, causing the nerve to be pressed against the extended piriformis. In this case, resisted testing of the piriformis or ordinary active piriformis contraction would separate the tendinous portion of the piriformis surrounding the sciatic nerve and would not compress the nerve.

Mizuguche⁹ felt that before the piriformis could aggravate the sciatic nerve there first had to be a preexisting tension on the sciatic nerve by scarring or arachnoiditis around the nerve roots secondary to laminectomy or some space-occupying lesion such as osteoarthritic spurs. He thought that ordinary walking would cause the piriformis to impinge the shortened nerve. A history of trauma to the sacroiliac or gluteal region has also been blamed¹⁰.

The straight leg raise may be positive due to a contracted piriformis muscle. In a study by Freiberg and Vinke¹¹ on 10 cadavers it was found that after raising the leg 25 degrees, the sacrotuberous ligament becomes taut because of its attachment to the ischial tuberosity and the hamstrings. A contracted piriformis muscle which originates off the sacrotuberous ligament also tightened during the SLR.

The functional tests for a piriformis syndrome is naturally based on the function of the piriformis muscle. One of the main reasons for muscle testing is to determine if a muscle is painful. Since the piriformis muscle is an external hip rotator when the hip is in extension and an abductor when the hip is in flexion,⁹ external hip rotation should be tested with the patient supine with the legs hanging off the table edge at the knees. The patient then attempts to push his leg medially against resistance. The abduction test for the piriformis could be tested with the patient sitting facing the examiner. The patient attempts to abduct the knee against resistance.² The patient will complain of pain and possible weakness due to the pain. There may be pain when the patient sits or squats due to external rotation of the thigh and hip.⁵ Passive internal rotation of the thigh with the patient supine could also aggravate the condition. Pressure on the piriformis by way of rectal or vaginal examination may reproduce the symptoms.³ A positive "piriformis sign" due to piriformis contracture may be seen by the persistent external rotation of one lower extremity when the patient is supine. A contracted piriformis may result in a functional short leg.⁵ The symptoms of female pain during coitus (dyspareunia) could be due to the externally rotated hips, but female pain and male impotency is also attributed to piriformis compression of the pudendal nerve and blood vessels.⁵

According to Retzlaff et al.,⁵ on the side of the piriformis contracture the sacral base will be rotated anteriorly and examination of a prone patient will show a deepened sulcus on that side. The apex of the sacrum will appear posterior on the opposite side at the level of the posterior inferior iliac spine (oblique axis rotation of the sacrum). This may cause rotoscoliosis of the lumbar spine and increased lumbar lordosis which may effect the function of the whole spine. Digital pressure over the piriformis may refer pain along the complaint area.

Part II will discuss a variety of conservative treatments for this syndrome.

Warren Hammer, M.S., D.C., D.A.B.C.O.

Editor's Note:

Dr. Hammer will conduct his next soft tissue seminar on ----date ----- in ---- place ----. You may call 1-800-327-2289 to register.

Dr. Hammer's new book, Functional Soft Tissue Examination and Treatment by Manual Methods: The Extremities, is now available. Please see the Preferred Reading and Viewing list on page xx, part #T126 to order your copy.

References

1. Jankiewicz JJ, Hennrikus WL, Houkom JA: "The appearance of the piriformis muscle syndrome in computed tomography and magnetic resonance imaging: a case report and review of the literature." Clin Orth & Rel Res:262,205-209.

2. Pace JB, Nagle D: "Piriformis syndrome." West J Med 24:436, 1976.
3. Wyant G: "Chronic pain syndromes and their treatment: III. The piriformis syndrome." Can Anaesth Soc J. 26:305, 1976.
4. Thiele GH: "Tonic spasm of the levator ani, coccygeus and piriformis muscles." Trans Am Pract Soc 37:145-155, 1936.
5. Retzlaff E, Berry AH, Haight AS et al. "The piriformis muscle syndrome." J AM Osteopath Assoc 73:799-807.
6. Gray H: Anatomy of the Human Body. 26th ed. Philadelphia: Lea & Febiger, 1956:541.
7. Freiberg AH: "Sciatic pain and its relief by operations on the muscle and fascia." Arch Surg 34:337m 1937.
8. Pecian M: "Contribution to the etiological explanation of the piriformis syndrome." Acta Anat (Basel) 105:181-186, 1979.
9. Mizughuchi T: "Division of the piriformis muscle in the treatment of sciatica." Arch Surg 111:719-722, 1976.
10. Robinson D: "Piriformis syndrome in relation to sciatic pain." Am J Surg 73:356-358, 1947.
11. Freiburg AH, Vinke TA: "Sciatica and the sacroiliac join." J Bone Joint Surg 16:126, 1934.

JUNE 1991