

The Piriformis Syndrome. A sciatic nerve entrapment misdiagnosed as lumbar radiculopathy. A case report and literature review

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ABSTRACT

The term Piriformis Syndrome describes an extrapelvic pressure of the whole or part of the Sciatic Nerve, at the level of the Piriformis muscle caused by various conditions and characterized Clinically by symptoms of sciatica. As early as 1928 Yeoman described extra pelvic entrapment of the sciatic nerve by the piriformis muscle as a cause of sciatica. After Mixter and Barr in 1934 described nerve root compression by disc prolapse as a cause of sciatica, this diagnosis dominated the Clinical thinking for nearly three decades and what had been previously described was nearly forgotten. The development of imaging techniques revealed other intraspinal compressing elements. On the other hand, cases of negative root exploration for Sciatica focused attention to extrapelvic sciatic nerve pathology. This report concerns the case of a patient, who after a negative root exploration for severe sciatica proved to have an extrapelvic cause for this problem at the level of the piriformis muscle due mainly to anatomic variation of the sciatic nerve in relation to the piriformis muscle.

KEY WORDS: Sciatica, Sciatic nerve, Piriformis Muscle

Case report

A sixty-four-year lady suffered from a severe sciatica in the S1 distribution of the left leg i.e. pain in the left buttock radiating to the posterior aspect of the thigh and calf and numbness of the plantar surface of the foot, with mild low back pain. These symptoms started one and a half year earlier after a fall on the buttocks and remained ever since being aggravated in sitting position.

After six months her doctor diagnosed PID and

referred her to a specialist who treated her with epidural steroid injection and physiotherapy without any improvement. The patient was referred to us with the diagnosis of Lumbar radiculopathy.

On physical examination, the lumbar spine was painless with free motion. The Lasegue test was positive at 60d there was mild atrophy of the left calf and absence of left Achilles tendon reflex. She could not stand on the toes of left foot. There was diminished sensation on the area of peroneal

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nerve. There was intense tenderness in the left sciatic notch. In EMG there are no recordings of the muscles innervated by the gluteal nerves.

Plain x rays revealed a mild stenosis of L5-S1 level. CTscan was negative for disc prolapsed but disclosed a narrowing of left iv foramina of L5. EMG and nerve conduction studies done elsewhere six months earlier disclosed lesion of the S1 nerve root (polyphasic recording in the gastrocnemius muscle and absence of H reflex). There were no recordings of the muscles innervated by the gluteal nerves. On the basis of the above findings the diagnosis of lateral spinal stenosis was made and the patient was operated on. Exploration of the left S1 nerve root by fenestration and foraminotomy revealed no abnormality. The nerve root was completely free and mobile. Two months later there was no improvement of the symptoms. There was again exquisite tenderness in the major sciatic notch. However, the clinical test described by Friberg and Vinke¹⁴ and by Pace and Nagle³¹ i.e., resisted external rotation of the hip from a position of internal rotation was negative. Repeat and more detailed electromyographic and nerve conduction study showed polyphasic potentials of the muscles innervated by the inferior gluteal and peroneal nerves (gluteus max and gastrocnemius) with sparing of the tibial and superior gluteal nerves. Nerve conduction studies of the sciatic nerves demonstrated prolongation of the F response, and absence of the H reflex. These findings were consistent with those of extapelvic entrapment of sciatic nerve at the level of the Piriformis muscle. Therefore, we had to explore this area and approach the sciatic nerve and its relation to the piriformis muscle. Leaving the pelvis through the greater sciatic foramen the sciatic nerve, usually passes under the piriformis muscle. (Fig.1)

But, in this case we found the sciatic nerve being divided well proximal to this muscle with the Tibial component passing below and the common Peroneal above it. The peroneal branch, lying on the surface of the piriformis muscle was adhered to it by perineural fibrosis. By meticulous removal of perineural fibrous tissue the nerve was released from the muscle surface. The piriformis muscle was detached from its insertion to the trochanter and

reflected medially leaving the peroneal branch of sciatic nerve to run free parallel to the tibial branch.

Clinical recovery was almost complete within three months.

Discussion

The piriformis syndrome may be due to various conditions, of which the relationship of the sciatic nerve to the piriformis muscle have a prominent role. This relationship is not constant. In most of the cases, the sciatic nerve leaving the pelvis through the greater sciatic foramen, usually passes under the piriformis muscle. (Fig.1) The muscle however may split in two parts and the nerve too, may have entirely separate tibial and common peroneal components. Therefore, several schemes of relationship between the two parts of the sciatic nerve and the piriformis muscle may occur. (Fig.2)

In a study of 1500 extremities Anson and Maddock² described the various schemes of relation of sciatic nerve to the piriformis muscle according to their occurrence (Fig.3). In case similar to one we report here, i.e., one of the branches of the divided sciatic nerve (the common peroneal) passed superficial to piriformis muscle and the Tibial behind (deep) to it, occurred only in 0,86%. In reported cases of P.S. available to us, we found no similar relationship of sciatic nerve to piriformis muscle.

The common peroneal nerve is vulnerable to trauma such as fall on the buttocks, which may give rise to a traumatic inflammatory process with epineurial fibrosis and adhesions. The traumatic factor has been often reported in cases of Piriformis Syndrome.^{24,31,38}

Another causative factor of P.S. reported in a number of cases is the persistence of sciatic artery¹ which is a fetal vessel, being the principal blood supply to the lower extremity in human embryo. Persistence of this artery in the adult is rare, leaving the pelvis in close proximity with the sciatic nerve. It is prone to vascular anomalies such as aneurism or sclerosis, which may cause pressure to sciatic nerve.^{18,23,29}

Pseudoaneurysm of the inferior gluteal artery may cause pressure to the sciatic nerve. Isolated cases of enlarged piriformis muscle due to trauma or to pyomyositis have been reported as compress-



Figure 1. The Sciatic nerve undivided passes under the piriformis muscle. This relationship of the nerve to the piriformis muscle is the most usual (88%, in 1500 Extremities found by Anson and Maddock). From the book "Surgical Anatomy by Anson and Maddock" W. B. Saunders. Co.1938



Figure 2. Adapted from Fig 1. The Sciatic nerve have been divided proximal to Piriformis muscle. The Tibial branch passing behind the muscle and the Peroneal above lying on the surface of it. (Our reported case)

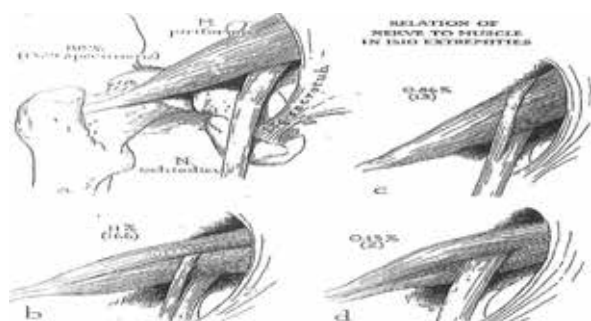


Figure 3. The percentage incidence of various relation of sciatic nerve to the piriformis muscle in 1500 extremities. By Anson and Maddock In the Book Surgical Anatomy 3d ed. Saunders Co London 1953, adapted from Beaton and Anson, J. Bone & Joint. Surg.20:686-688,1938

ing factors to sciatic nerve.

The symptoms of sciatica may suggest a lumbar radiculopathy. Saal et, at reported that of 4000 patients referred for suspected for lumbar radiculopathy, 36 were found to have peripheral nerve entrapment. Of these 49% had backpain problems. The similarity of clinical symptoms of P.S. to lumbar root entrapment, may drive to erroneous nerve root exploration (as it happened in our case), especially if there are concomitant spinal pathology buttocks, sciatic notch or pain in sitting position and some cases pain during sexual intercourse in younger women, suggest the diagnosis of compression of the sciatic nerve. The most specific

clinical test described by Friberg and Vinke, and by Pace and Nagle is not always positive because the peroneal branch of sciatic nerve passing superficial to piriformis muscle is not compressed by the maneuver. Rectal examination is useful in cases of enlarged or inflamed piriformis. Neurophysiological studies are essential in the confirmation of diagnosis but keeping in mind the entrapment of sciatic nerve at the level of piriformis. In a such cases, the superior gluteal nerve, arising proximal to piriformis muscle is free, therefore the gluteous medius, minimus and the tensor fasciae latae show no abnormal potentials. On the other hand, muscles innervated by the inferior gluteal nerve (Glut. Maximus) which arise distal to piriformis muscle may show abnormal findings. Nerve conduction studies of the sciatic nerve demonstrate either delay or abrogation of F waves and H reflexes. Computerized Tomography and MRI are helpful in diagnosis only in cases of enlargement of the piriformis muscle, either from tumor or inflammation. Some cases have been reported to have been successfully treated by local corticosteroid injections or by physiotherapy. However, in a great number of cases conservative treatment fails to relieve symptoms and the recommended treatment is surgical by section of the tendon of piriformis and in some cases such as the reported here, neurolysis of the affected branch of the sciatic nerve. [Ⓐ]

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