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A Case of Non-Disc, Non Piriformis Syndrome Sciatica

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BACKGROUND

A 40 year old runner developed buttock pain, with radiating symptoms down his right leg. The pain was exacerbated by exercise. He had sustained a minor injury to his back and pelvis, when he slipped on a kerb while running 6 months earlier. The patient stated that he straightened his leg and abducted his hip in an effort to avoid falling. His examination revealed a positive straight leg raise at 100 degrees; His right S1 ankle reflex was absent.

A lumbar spine MRI scan was normal. A needle EMG confirmed acute on chronic denervation in the L5 and S1 distribution with a normal paraspinal screen.

His Tibial H reflex was normal in the supine position, but showed focal slowing and amplitude loss when the hip was placed in a forced flexed and adducted position.

An MRI of pelvis was sought to assess for focal entrapment of the sciatic nerve by the piriformis muscle. The piriformis muscle was normal but the quadratus femoris[QF] muscle showed evidence of a local muscle tear and tendonitis with associated effusion.

The symptoms resolved following steroid injection at the level of the QF tendon injury and effusion, under ultrasound and EMG guidance.

The case describes an example of an acute on chronic sciatica caused by a local injury to the quadratus femoris muscle.

CASE DESCRIPTION

Traumatic quadratus femoris muscle tear is a clinically unsuspected injury. It is a rare condition and the clinical features are common to other disorders that cause of buttock and leg pain, such as an L5/S1 disc prolapse, Spondylolysthesis, Sacro-illiac joint dysfunction, pelvic fracture and Piriformis Syndrome. There is a relatively small literature on quadratus femoris muscle injury.[1,2] The involvement of the sciatic nerve is a rare consequence of a quadratus femoris muscle tear.

In this cases, EMG identified the cause of the sciatic nerve irritation , and magnetic resonance imaging (MRI) was crucial both in clarifying the diagnosis of a local muscle tear to the quadratus femoris muscle with a secondary effusion causing the sciatic nerve irritation.

Ultrasound and EMG guidance using a concentric injecting needle with neuro-stimulation, were used to place the injection of methylprednisolone acetate (Depo-Medrone),[1] at the site of injury and effusion for the treatment of this case of quadratus femoris muscle injury associated with persistent sciatica, which was treated with non-surgical guided injection.

The quadratus femoris muscle is a flat quadrilateral muscle (Figure 1) that arises from the upper external border of the ischial tuberosity and inserts at the quadrate tubercle of the femur. [3] It acts as a hip external rotator and assists adduction.[3,4] The quadratus femoris muscle is innervated by the quadratus femoris nerve which rises from the ventral roots of the L4, L5 and S1 nerves in 79.4% of patients.[5] In adults, the myotendinous junction is the most vulnerable location for injury. [6,7] The tendon insertion in the bone may also be affected.

A review of seven cases. [1] Confirmed that this type of injury occurs predominantly in women (In our case the patient was male), with a female to male ratio of 6:1. The age of patients ranges from 17 to 43 years with an average age of 29.6 years.

The symptoms were hip pain in three patients, groin pain in one patient and deep posterior thigh or gluteal pain in three patients. In none of the cases reported was there a correct clinical diagnosis of quadratus femoris muscle tear. In this series the sciatic nerve was not compromised, and the diagnosis was confused with soft tissue injuries or lumbar radiculopathy. The delay from time of injury to correct diagnosis varied from one day to five months. [1] In one case the injury was located at the tendon insertion and in the rest at the musculotendinous part. All cases were evaluated by MRI examination.

The exact mechanism of this injury is unknown. In tennis players it may result from a strong eccentric stress upon the quadratus femoris

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muscle in an attempt to control hip internal rotation during the follow-through phase of serving.[2] On the other hand, a congenitally smaller distance between the lesser trochanter and the ischial tuberosity is a predisposing factor for impingement of the quadratus femoris muscle. [8] In this case the injury occurred as the patient slipped off the kerb, as he was running , and he suddenly extended and abducted his hip.

Neurophysiology

The critical diagnostic evaluation was the neurophysiological assessment of the lower limb which confirmed denervation in the L5 TFL and the Tibialis Anterior muscles, and in the S1 Biceps Femoris, Medial Gastrocnemius, Soleus and EDB muscles, with a normal paraspinal screen.

The Tibial H reflex, which assess the proximal tibial -sciatic nerve pathway was normal in the supine position, but showed focal slowing when the hip is placed in a flexed, adducted, and internally rotated position. This causes the deep buttock muscles to contract: the piriformis, obturatorinternus and quadratus femoris muscles (Figure 2).

The EMG and MRI suggested a non- disc form of sciatica. The most common cause is "Piriformis Syndrome", where the sciatic nerve is entrapped by the sciatic nerve.(Figure 3) Muscle spasm in the piriformis muscle can be caused of irritation in the piriformis muscle itself, due to a local injury or irritation of a nearby structure such as the sacroiliac joint or hip. In this case the quadratus femoris strain at the tendon-bone junction resulted in an organized mass which compressed the sciatic nerve, simulating piriformis syndrome.

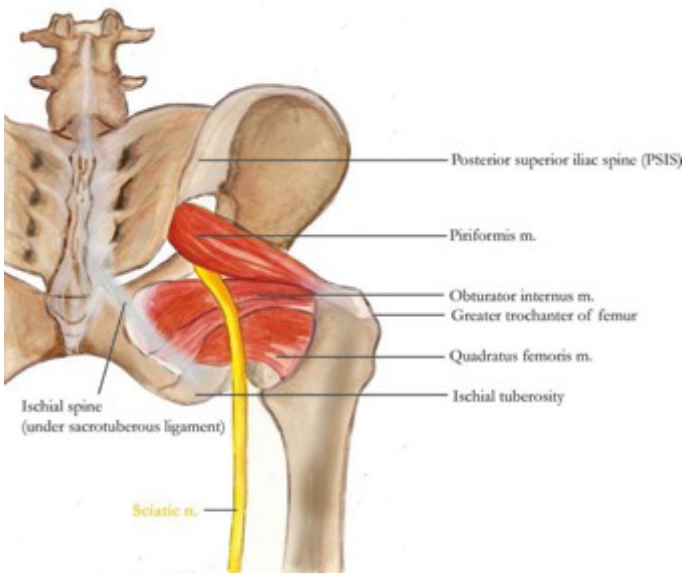

Figure 1: The course of the sciatic nerve through the posterior pelvis, with its anatomical proximity to the piriformis and quadratus femoris muscles.

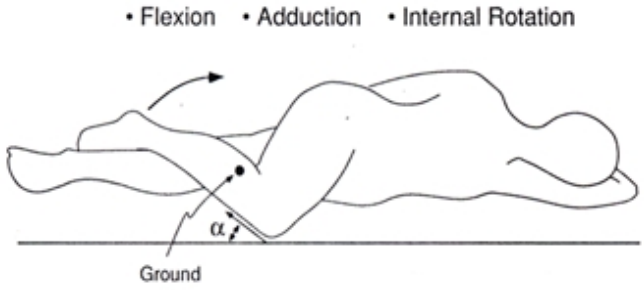

Figure 2: The FAIR position, where the lower limb and pelvis are placed in a specific position to contract the posterior pelvic structure compressing the sciatic nerve in the pelvis. It is useful as both a clinical provocative test , and during Tibial H reflex testing.

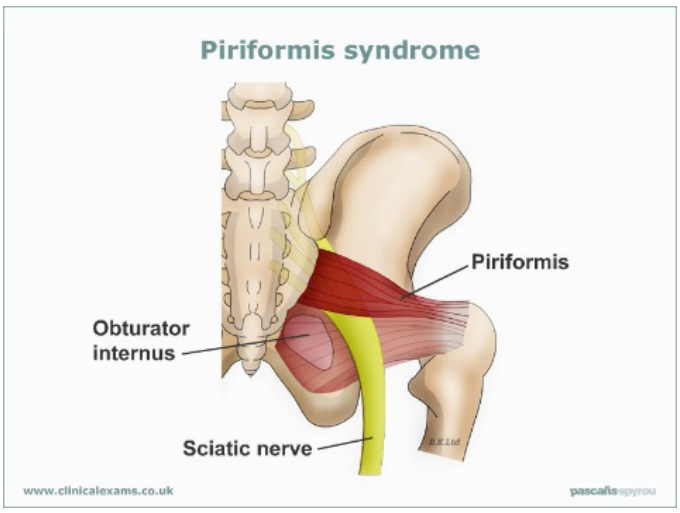

Figure 3: Entrapment of the sciatic nerve by the piriformis muscle.

MRI has an important role in confirming the clinical suspicion, ruling out other soft tissue injuries and aiding prognosis.[1,9,10] Published case reports have shown the correlation of quadratus femoris tendinitis with groin pain,[11] and muscle tear with hip pain. [1] According to O'Brien and Bui-Mansfield, axial T2-weighted fat-suppressed magnetic resonance (MR) images have demonstrated the presence of edema between the lesser trochanter and ischial tuberosity. On sagittal T2-weighted fat-suppressed images the edema is localized posterior to the lesser trochanter. [1]

CONCLUSIONS

Quadratus Femoris muscle injury with irritation of the sciatic nerve is a rare clinical syndrome. The primary symptoms of a severe quadratus femoris strain are buttock pain with posterior thigh pain, which is aggravated by sitting or activity, and reproduction of buttock pain on prolonged hip flexion, adduction and internal rotation. In this incidence there was also sciatic nerve involvement.

Electromyography and Tibial H reflex nerve conduction studies identify the sciatic nerve as the source of the pathology. Electromyography and MRI of lumbar spineconfirm there was no lumbar or sacral nerve root involvement

MRI of pelvis is crucial in identifying this unusual injury and in excluding damage to neighbouring structures. However, due to the presence of extensive hematoma, imaging may downstage the degree of strain. The above injury should be considered in the differential diagnosis of any patient presenting with proximal thigh pain after injury. The therapy is usually conservative consisting of rehabilitation but, in the case of persisting symptoms, open sciatic nerve decompression should be an alternative approach.

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