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Case Report

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Case Report: S1 and S2 Nerve Root Entrapment Due to Hypertrophied Piriformis Muscle Mimicking Posterior Femoral Cutaneous Nerve Entrapment Neuropathy

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Abstract

We report a case of S1 and S2 nerve being entrapped by a hypertrophied piriformis muscle.

Keywords

Piriformis muscle hypertrophy entrapment, S1 and S2 nerve root

Introduction

A 60-year-old gentleman had presented to our clinic, with one-year duration of symptoms in the posterior aspect of the left thigh exacerbated by sitting. NCV/EMGs of bilateral lower extremities were within normal limits. MRI of the lumbosacral spine did not reveal neuroforaminal stenosis. MRI of the pelvis showed a hypertrophied piriformis on the left side causing entrapment of the S1 and S2 nerve roots.

Case report

A 60-year-old gentleman who is right-handed, presented with complaints of pain in the posterior aspect of the left thigh whenever he would sit down. He felt as though the thigh was being choked of the vascular supply. In addition, he would feel numb and reported that the pain would radiate to his calf muscles. After one year of increase in pain symptoms, narcotics were prescribed for pain alleviation.

He was married, very sedentary, and denied any alcohol or tobacco use. His family history was noncontributory for any neuromuscular disorders.

MRI of the lumbosacral spine did not reveal any significant neural foraminal encroachment. However, a subsequent MRI of the pelvis showed hypertrophied piriformis on the left, resulting in encroachment of the exiting left S1 and S2 nerve roots at the level of the neuro foramina.

Upon examination, the patient was awake alert oriented × 3. Cranial nerve examination was within normal limits. Motor examination showed normal strength in both upper extremities. Right lower extremity strength examination showed a strength of 5/5 both distally and proximally. However, on the left lower extremity: strength at the ankle was 5-/5 in the dorsiflexors, ankle flexors, invertors, and evertors. Hamstrings 4/5, hip flexors 5/5, hip extensors 5-/5.

Sensory exam showed a dermatomal loss of sensation to pinprick touch and temperature sense in the area supplied by the left posterior femoral cutaneous

nerve of the thigh. Knee reflexes were 2/4. Ankle jerks were absent on both sides. Plantar reflexes were down going on both sides. Coordination was intact. He had significant difficulty with sitting and showed mild antalgic gait with walking.

EMG and NCS performed in 2016, may have been performed too early in the course, and did not demonstrate abnormalities in the nerve conductions and the electromyography.

Discussion

The posterior femoral cutaneous nerve (PFCN) is one of six branches directly off the sacral plexus, prior to its convergence into anterior and posterior divisions. It arises from the posterior divisions of the anterior rami of S1 and S2 nerves and the anterior divisions of anterior rami of S2 and S3 nerves [1].

It initially emerges lateral to the anterior sacral foramina and lies upon the psoas muscle, underneath the muscle's parietal pelvic fascia. It travels laterally into the greater sciatic foramen, where it exits the pelvis below the piriformis muscle (Figure 1A. Blue arrow shows the PFCN).

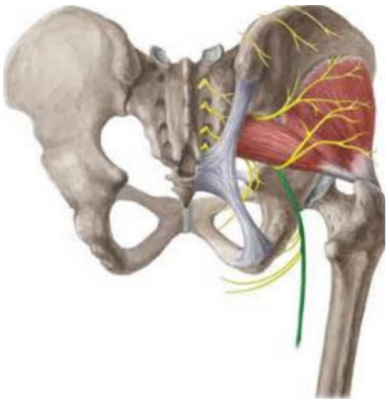

Figure 1A: PFCN exiting the greater sciatic foramen.

The involvement of the posterior femoral cutaneous nerve (PFCN), contributes to the symptom of "Sitting pain" (Figure 1B).

Isolated posterior femoral cutaneous neuropathy is rarely encountered. Case reports have been described instances of posterior femoral cutaneous neuropathy secondary to inguinal hematoma formation after gluteal intramuscular injection [2, 3]. Compression of the Posterior Femoral cutaneous nerve can also occur as a part of the piriformis syndrome, both primary and secondary [4].

The Russell et al. report that in routine pelvic MRIs they performed in 33 males and 67 females only one had S1 nerve root course through the piriformis on one side. The S2 nerve roots course to the piriformis in about 75% of the patient's, and S3 nerve root course through the piriformis in 97% of the population [5].

Figure 1B: Branches of the PFCN involved in the "Sitting pain".

MRI of the pelvis in our patient demonstrated circumferential entrapment of both the left S1 and S2 nerve roots at the level of the neuroforamen (Figure 2B). On the respective coronal unenhanced T1 images, the S1 nerve traverses through the hypertrophied left piriformis muscle (Figures 2A, 3A, 3B). In addition, the hypertrophied left piriformis muscle encroaches the left S2 neuroforamen and contacts the exiting left S2 nerve, which predisposes to impingement of the nerve (Figure 3C).

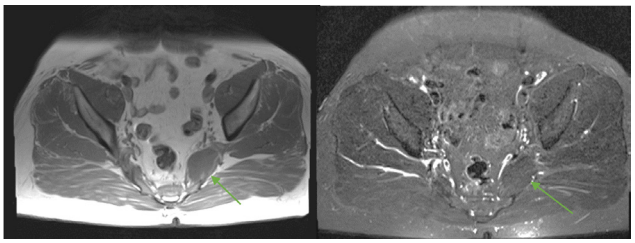

Figure 2A: Unenhanced T1 axial and STIR images of the pelvis demonstrate a hypertrophied left piriformis muscle.

In the past month, fluoroscopically guided Left L5, S1 transforaminal epidural steroid injection, was performed at our institution. The patient reported partial relief, but recently his clinical course has been complicated by lower gastrointestinal problems, with abdominal pain caused by colitis. Additionally, consultation was placed for intramuscular Botox administration into the Piriformis muscle [6].

Conclusion

In conclusion, PFCN neuralgia has been widely reported as cause for "Sitting pain" [7]. The presentation and the clinical exam suggested a PFCN compression by the piriformis muscle like a primary piriformis syndrome, but the imaging localized it to the entrapment of the S1 and S2 nerve root by the piriformis. These findings were more evident on the MRI of the pelvis as opposed to the MRI of the lumbar spine, thus underscoring the need for further imaging interrogation if the MRI of the lumbar spine is inconclusive. The entrapment of the S1 and S2 nerve by the piriformis muscle also should be included in the causative factors for the PFCN neuralgia.

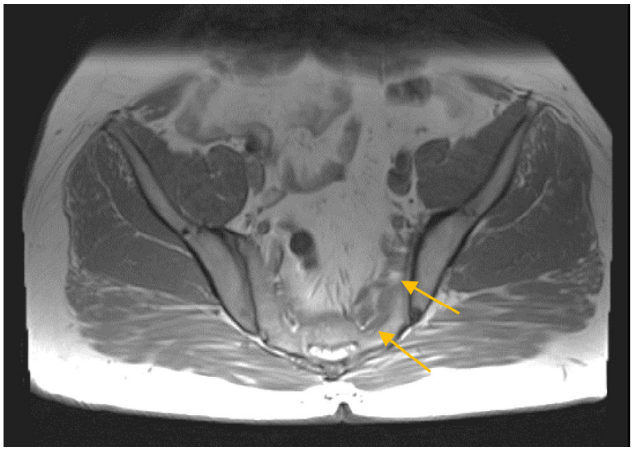

Figure 2B: Unenhanced T1 axial image (at a level more cephalad to Figure 1A) of the pelvis demonstrate slips of the hypertrophied left piriformis muscle circumferentially entrapping the S1 and S2 nerve roots as they exit their respective neuroforamina.

Figure 3A: Unenhanced T1 coronal image of the pelvis demonstrate a hypertrophied left piriformis muscle.

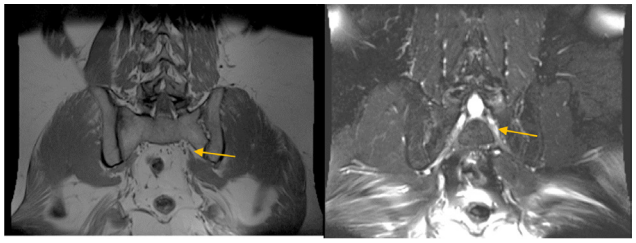

Figure 3B: Unenhanced T1 and T2 fat saturated coronal image of the pelvis demonstrates the S1 nerve traversing through the left piriformis muscle.

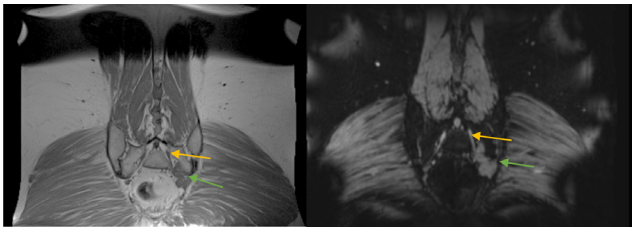

Figure 3C: Unenhanced T1 and T2 3 dimensional coronal images (at a level more posterior to both Figures 3A and 3B) of the pelvis demonstrates hypertrophy of the left piriformis causing encroachment of the left S2 neuroforamen and contacting the left S2 nerve as it exits the neuroforamen.

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Conflict of Interest

None declared.

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