

Abstract

Piriformis syndrome has long been a diagnostic quandary due to its tendency to present as other nerve-related conditions. Piriformis syndrome is commonly caused by entrapment of the sciatic nerve as it travels through the greater sciatic foramen due to hypertrophy of the piriformis muscle. However, its constellation of symptoms, including radiating pain down the thigh, can easily be mistaken for lumbosacral radiculopathy. This case report aims to address the misdiagnosis of piriformis syndrome which has prolonged pain for many patients and increased the cost of medical care. It demonstrates a 76-year-old female with a confounding presentation of piriformis syndrome: buttock pain radiating down the thigh and lower leg, a positive straight-leg test, and a positive FAIR test. The diagnosis was ultimately confirmed with intramuscular piriformis injection. This study highlights the diagnostic difficulties between piriformis syndrome and lumbosacral radiculopathy and can be used as a guide to help improve care for lower radicular pain patients.

Introduction

Piriformis syndrome (PS) is a cause of chronic pain in the buttock area due to compression of the sciatic nerve as it passes through the piriformis muscle and underlying somatic myofascial dysfunction⁵. It typically presents with sciatic-like pain of the buttock that radiates down the posterior thigh and lower leg with associated numbness and tingling⁷. PS is typically aggravated by prolonged sitting or specific activities (climbing stairs, cycling, sitting cross-legged) that can irritate the piriformis muscle¹¹. There is no gold standard diagnostic test for PS, so it remains a diagnosis of exclusion after all other potential causes of buttock and lower extremity pain have been disqualified⁸. Although definitive diagnostic measures have yet to be developed, various positive clinical signs (including the FAIR test, active piriformis test, or pace test) can aid in its diagnosis¹⁰. Pain management for PS consists of conservative measures including rest, piriformis stretching exercises, oral non-steroidal anti-inflammatory drugs (NSAIDs), and muscle relaxants. Local anesthetics, steroid injections, and botulinum toxin injections can be used if conservative management fails⁷.

Neural and vascular entrapment by the piriformis muscle against the greater sciatic foramen and surrounding somatic myofascial structure dysfunction are widely accepted to be the causes of symptoms in PS⁷. The somatic or muscular component of PS has elements of trigger point referred pain (from hamstring muscles, the obturator internus, and piriformis muscle itself) and previous gluteal trauma^{13,14}. Irritation of the sciatic nerve and its neighboring nerves and vessels via constriction by surrounding structures generates the characteristic dermatomal pain pattern. Hypertrophy of the piriformis muscle, trauma, overuse, or other anatomical irregularities are proposed mechanisms that predispose individuals to PS⁵.

Due to its inconsistent clinical presentation, PS has remained a diagnostic difficulty for clinicians who erroneously attribute its symptoms to lumbosacral nerve root impingement. Lumbosacral radiculopathy and PS both present with radiating low back and buttock pain in a dermatomal pattern, tingling, or paresthesias, with a positive SLR test commonly seen in both⁹. MRI has proven to be a useful tool in discerning between the two disorders¹². However, if MRI studies prove to be inconclusive or contradictory, nerve conduction velocity testing can help differentiate between peripheral neuropathy and spinal cord causes⁶. Our study involves a patient with PS mimicking radiculopathy with a definitive diagnosis confirmed by symptomatic resolution following intramuscular piriformis injection.

Case Report

A 76-year-old male presented with a one-year history of burning left lower back and left buttock pain. The buttock pain radiated down his posterior left thigh and leg. He noted that his pain was worse upon standing from a seated position and he could not tolerate long walks. The pain was unchanged with prolonged sitting. The patient rated his pain a 7/10 on a numerical pain scale (NPS). He denied any weakness, numbness, and tingling. His medication regimen included gabapentin, cyclobenzaprine, and ibuprofen/famotidine which provided mild-moderate pain relief.

The patient had two exacerbations of his left buttock pain during the previous month, both of which required emergency department visits. MRI at the time showed stenosis at the right L4-L5 lateral recess and bilateral foraminal stenosis with lumbar degenerative changes. He was sent home with a muscle relaxant and methylprednisolone dose pack but the pain persisted. There were no red flags and examination of all other systems was normal. A primary provisional diagnosis for piriformis syndrome was made with a secondary diagnosis for lumbosacral radiculopathy due to its dermatomal pattern and MRI findings.

Upon examination, the patient's left piriformis muscle was tender to palpation. The lower extremity flexion, adduction, and internal rotation (FAIR) test was positive on the left. The straight leg raising (SLR) test was positive on the left at 50 degrees. Hip, knee, and ankle flexors and extensor strength were intact. Sensation over bilateral lower extremities and ankle reflexes were normal.

The left piriformis muscle was injected with a solution of 2cc lidocaine and 1cc triamcinolone 40mg/ml in a fanning technique which achieved substantial pain relief. This confirmed our initial diagnosis of piriformis syndrome.

References

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Discussion

Piriformis syndrome occurs when the sciatic nerve is compressed as it passes through the piriformis muscle. It remains difficult to diagnose due to its vague presentation and overlap with other neuropathic conditions. The diagnosis itself still lacks definitive criteria, which leads to both misdiagnosis and underdiagnosis in clinical practice. The incidence and prevalence of PS varies widely based on the literature, reflecting the absence of a gold standard test or set clinical criteria for diagnosis. Reports have a prevalence ranging from 6-36%⁴, while some studies suggest that PS is overdiagnosed¹, while other newer studies state that it remains underdiagnosed^{2,3}. A systematic review by Hopayian identified common clinical features of PS including, buttock pain, aggravation of pain with sitting, external tenderness, and increased pain in maneuvers that activate the PM⁵. Along with difficulties in consistency of clinical presentation, PS is known to present similarly to lumbar radiculopathy⁶.

In our case, PS emerged as the primary diagnosis based on clinical findings such as localized tenderness over the piriformis muscle, increased pain with hip movement, a positive FAIR test, and characteristic radiating pain down the posterior thigh and leg. However, the presence of the dermatomal pain pattern, conflicting MRI results, and a positive SLR test raised suspicion for lumbosacral radiculopathy, necessitating a comprehensive diagnostic approach.

Conservative management, including rest, NSAIDs, and muscle relaxants, provided only partial relief, underscoring the need for a definitive diagnostic intervention. Intramuscular piriformis injection, a commonly employed diagnostic and therapeutic modality, led to substantial pain relief, confirming the diagnosis of piriformis syndrome.

While diagnostic modalities such as ultrasound, electromyography, and imaging studies can aid in excluding alternative diagnoses, their utility in confirming PS remains limited. Recent studies suggest the potential role of EMG in diagnosing PS based on the elicitation of H-reflexes during provocation maneuvers, offering promising avenues for further research and a gold standard diagnostic test⁷.

Our case highlights the importance of nuanced clinical history-taking, assessment, and consideration of PS in patients presenting with lower extremity radicular pain. Further research should focus on standardizing diagnostic criteria and management strategies to enhance the accuracy and timeliness of diagnosing PS. This will not only lead to a reduction in medical expenses but also improve patient outcomes.

Conclusion

In conclusion, the presented case underscores the diagnostic challenges inherent in distinguishing PS from lumbosacral radiculopathy, emphasizing the importance of comprehensive clinical evaluation. The successful confirmation of PS in our patient through intramuscular injection not only resolved the diagnostic uncertainty but also offered therapeutic benefits, aligning with existing literature advocating for this approach. Moving forward, increased awareness among physicians regarding the clinical features and diagnostic nuances of PS is crucial to facilitate timely interventions. Further research into standardized diagnostic criteria for PS is warranted to optimize patient care and improve outcomes in individuals with lower radicular pain syndromes.