Short Communication

Clinical Outcomes of Surgical Treatment for Piriformis Syndrome

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Abstract

Background: Piriformis Syndrome (PS) is an compressive neuropathy of sciatic nerve at the level of ischial tuberosity multiple factors are involved in this disorder including anatomical variation in the pathway of sciatic nerve through or near the pirifomis muscle and bipartite pirifomis. There are also other factors that may contribute to compression including muscle spasm, trauma and tumor. **Objectives:** this study aims to explore the clinical presentation, diagnostic challenges, and effective management approaches for PS. **Materials and Methods:** This single-center case series included consecutive patients diagnosed with PS and treated between January 2023 and May 2025. Inclusion criteria comprised a clinical diagnosis of PS during the study period, completion of both conservative and surgical treatments, and availability of MRI imaging. Data collection occurred after the completion of all clinical care, with the data subsequently organized and analyzed qualitatively. **Results:** This study included 10 patients diagnosed with PS, comprising 7 males (70%) and 3 females (30%), aged 22 to 46 years. 9 patients (90%) reported chronic buttock pain radiating down the leg. Diagnosis was established using the FAIR test and MRI. All patients were initially treated conservatively; however, symptoms did not improve, necessitating surgical intervention. Following operation, 8 patients (80%) achieved good to very good symptom relief. **Conclusion:** Identifying PS as a distinct clinical condition and applying a systematic diagnostic and treatment approach can lead to meaningful improvements in patient outcomes. Surgical treatment, informed by clinical assessment and imaging findings, may reduce morbidity and improve functional outcomes, especially in patients who do not respond to conservative therapy.

Keyword: Sciatic nerve compression, Buttock pain, Paresthesia, FAIR Test, Conservative treatment

Introduction

Piriformis Syndrome (PS) is entrapment of the sciatic nerve at the level of ischial spine causing irritation of the nerve in the buttock region unlike sciatica caused by spinal problems; PS originates outside the spine, making it a unique and often overlooked source of lower body discomfort [1]. The piriformis muscle originates from the anterior surface of sacral bone, from S to S4 and attaches distally to the grater trochanter of the femur. It provides mainly external rotation to the hip and also contributes weakly to the hip abduction and flexion. The muscle is supplied by S1, S2 and L% nerve roots. Typically the sciatic nerve passes beneath the piriformis muscle, but in 16% of people, it may pass through or above the muscle [1, 2]. Multiple factors are involved as a cause of PS including anatomical variations in the course of the sciatic nerve as it passes through or near the piriformis muscle, as well as by muscle spasm, trauma, or other factors leading to nerve compression. Excessive use and increasing size of the muscle may also contribute to the cond-

ition. Some define PS broadly to include any factor that compression of the sciatic nerve such as from osteophytes, hematomas, or pelvic cysts. Other causes like fractures and hip surgery can mimic PS symptoms and are called secondary PS or pseudo sciatica [3]. PS is a leading cause of sciatica and buttock pain. Its reported prevalence varies, but one study showed that among 2,910 patients with low back or buttock pain, 6.25% were clinically diagnosed with PS. The affected individuals ranged from 19 to 75 years old, with a mean age of 43 years, and the condition was predominantly found in females [4]. PS is primarily a clinical diagnosis but Magnetic Resonance Imaging (MRI) has a critical supportive role by helping to exclude other causes of sciatica-like symptoms MRI can illustrate signal abnormalities of the sciatic nerve and its relationship with the normal and abnormal piriformis muscle, which may be helpful in the diagnosis of PS [5]. This studies goal is to investigate the clinical features, diagnostic challenges, and successful surgical management strategies of PS, with a focus on role of open surgical treatment.

Materials and Methods

Study Design

This single center case series involved patients diagnosed with piriformis syndrome that are treated at Smart Health Tower between January 2023 and May2025 .informed consent were taken from all participants to allow the publication the given data. Ethical approval for the study was received from ethical department of college of medicine, University of sulaimani.

Inclusion and exclusion criteria

Patients that are included if they diagnosed as piriformis syndrome during the study period, had received both conservative and surgical interv-ention and had MRI imaging. Patients that had lumbar disc herniation, lumbar spinal stenosis, or other spinal causes of sciatica and patients that had history of lumbar spine surgery were also excluded.

Surgical procedure

Patients were positioned in the lateral decubitus position. After finishing of the surgical safety checklist and draping, a posterior approach was performed through a 6 cm skin incision. Gluteus Maximus dissection carried out to expose the short external rotators of the hip. The piriformis tendon, identified as it has long tendinous structure .sciatic nerve was visualized for any anomalies then decompression of the nerve done by releasing of the piriformis tendon. Hemostasis was fixed, and the wound was closed in anatomical layers. All patients stayed at the hospital for one day postoperatively.

Statistical Analysis

The data were collected using Microsoft Excel (version 2021) and analysis was done using SPSS software (version 27.0). Findings were reported as frequencies with percentages, and means and by standard deviations.

Results

The study is comprised ten patients diagnosed as PS, consisting of seven males (70%) and three females (30%), age of them were between 22 and 46 years. Chronic buttock pain radiating down the leg was reported by nine patients (90%), aggravated by sitting or hip movements. Paresthesia was noted in seven patients (70%), mainly affecting the posterior thigh and leg. Symptom duration ranged from 2 months to 16 years. The FAIR (Flexion, Adduction, and Internal Rotation) test was performed on nine patients, all of whom showed a positive result (100%). MRI findings showed an accessory piriformis muscle in 2 patients (20%), asymmetry in muscle size in 5 patients (50%),

bilateral hypertrophy in 2 patients (20%) and relative hypertrophy in 1 patient (10%). All patients from the beginning received conservative treatments, including medications including nonsteroidal anti-inflammatory drugs (NSAIDs) physiotherapy focused on piriformis muscle stretching and strengthening, and postural correction. Despite doing these measures, all ten patients failed to improve and subsequently underwent surgical intervention. Postoperatively, eight patients (80%) demonstrated well to very good symptom relief, while tow patients (20%) showed no improvement. No major perioperative complications were reported (Table 1).

Discussion

PS is an compressive neuropathy in which the sciatic nerve is compressed or irritated producing sciatica symptoms including numbness or tingling in the buttock , posterior thigh, leg or foot [6]. PS is thought to be more common among middle-aged adults due to mechanical stress over time [7]. However, in the present study, patient ages ranged from 22 to 46 years, demonstrating that PS can affect different age population, including younger individuals. This finding proposes that even adults in their twenties may present with advanced symptoms of PS, indicating that age alone should not rule out the diagnosis. Previous studies have revealed a higher frequency of PS among females, potentiallly due to anatomical and hormonal differences, particularly in pelvic structure [1, 8]. In contrast, the present study demonstrated a male predominance, with seven males and three females. These findings call into question the existence of a strong sex predilection for PS, especially within the context of small clinical samples PS mainly produces buttock pain and radicular symptoms. In the studies by Michel et al. (2013) and Singh et al. (2013), all patients (100%) demonstrated with buttock pain increased by sitting, along with radicular pain radiating down the leg [4, 9]. Comparably, in the present study, 90% of patients reported buttock pain, which was aggravated by sitting. And all patients experienced radicular pain, aligning with the findings of Michel and Singh. These results reinforce that sitting-induced buttock pain and radiating leg pain are hallmark clinical features in the diagnosis of PS. PS usually goes undiagnosed for periods of time because of its clinical overlap with lumbar radiculopathy [10]. In line with this, our study observed wide variability in symptom duration, ranging from a few months to several years. Patients that have long duration of clinical features of PS symptoms are prone to experience more severe sciatic pain and greater functional impairment from the time of diagnosis, because of this early and accurate differentiation of PS from other causes of sciatica is necessary. Although paresthesia is less commonly reported in PS by some studies in the study by Singh et al. (2013), only 2.2% of patients experienced paresthesia, suggesting it is an uncommon clinical feature in their study [4]. In contrast, our study found that 70% of patients reported paresthesia, mostly along the posterior thigh and leg. This large discrepancy may be due to sample size, patient selection, or differences in symptom interpretation. The FAIR test is a widely used maneuver in diagnosing PS. In the study by Michel et al. (2013), the FAIR test was positive in 100% of patients, highlighting its high diagnostic sensitivity [9]. In the present study, the FAIR test was performed on nine patients, all of whom demonstrated a positive result (100%). These findings align with those reported by Michel and further support the FAIR test as a reliable clinical tool for diagnosing PS. MRI is valuable imaging modality in detecting nerve or muscle variation that may contribute to PS (8). In our study, MRI findings included, asymmetry in

piriformis size, accessory muscle and bilateral hypertrophy .these data further supports the utility of MRI as a valuable diagnostic tool in PS. notably, the only patient without significant imaging abnormalities failed to improve postoperatively, suggesting a potential association between MRI-detectable anatomical variation and more favorable surgical outcomes. Guideline for management of PS highlights that surgical treatment should be considered only after the failure of conservative treatments including physical therapy medications and local injections [11]. In our study we followed this approach all patients previously received unsuccessful conservative treatment before surgery was followed .these findings supports currents guideline treatments thar refractory PS may warrant surgical treatment especially when supported by imaging. In the present study, 80% of the patients experienced "good" to "very good" resolution of symptoms following surgical decompression. Martin et al. (2011) reported favorable outcomes for patients undergoing endoscopic decompression for PS [12]. The two patients who did not show significant improvement had either chronic symptoms or unremarkable imaging findings. One patient with bilateral piriformis hypertrophy improved significantly. This study has several limitations, including the small sample size and single-center design limit the applicability of the results. The absence of standardized functional outcome measures limits the objective assessment of postoperative improvement. Lastly the duration of postoperative follow-up varied between patients which potentially affecting the consistency and reliability of long-term outcome assessments.

Conclusion

PS as a distinct clinical subject and applying a structured diagnostic and therapeutic framework can significantly improve patient outcomes. Surgical intervention guided by both clinical suspicion and imaging, can reduce morbidity and restore function in affected individuals, particularly when conservative measures fail

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Table 1: Patient Characteristics, MRI Findings, and Treatment Outcomes

Parameters	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
Age (year)	28	44	35	22	44	46	31	37	35	41
Sex	Male	Female	Female	Female	Male	Male	Male	Male	Male	Male
Buttock pain in the sitting position	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Radiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Side	Right	Left	Left	Left	Left	Left	Bilateral	Right	Left	Bilateral
Paresthesia	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes
Duration	2 months	16 years	9 years	12 years	2 years	7 years	4 years	6 years	10 years	3 years
FAIR test	Positive	Positive	Positive	N/A	Positive	Positive	Positive	Positive	Positive	Positive
Conservative management	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Failed	Failed
Response after surgery	Good	Good	Very good	No response	Very good	No response	Very good	Very good	Good	Very good
Follow-up duration (months)	16	19	30	14	18	7	8	26	11	28
MRI findings	Accessory piriformis muscle on the right crossing over sacral foramen; S2 nerve passes between accessory and proper piriformis, no edema.	Bulky left piriformis (>2 cm thick); radiological features suggest left-sided piriformis syndrome.	Asymmetry in piriformis muscle size: left side larger.	Left piriformis relatively larger; not definitive for Piriformis Syndrome	Asymmetric piriformis, larger on left with normal signal; mild anterior fluid, suspicious for piriformis syndrome.	Normal muscle bulk; left side shows an additional fascicle from the sciatic notch, possibly accessory piriformis.	Bilateral hypertrophied piriformis muscles	Hypertrophied right piriformis muscle (2.7 cm thickness)	Asymmetry of both piriformis muscle, right side mildly atrophic (18 mm) compared with left side (22 mm)	Bilateral enlargement of piriformis muscles, approximately 2.5 cm in thickness.

FAIR: Flexion, Adduction, and Internal Rotation; **MRI:** Magnetic resonance imaging