

Posterior Hip Pain: Ultrasound Imaging/Guidance for Piriformis Syndrome



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SECTION 2 – ANSWER

CASE

A 53-year-old male patient suffered from dull pain and intermittent numbness over his left buttock/thigh for the past 2 months. He denied back pain or subjective muscle weakness. He had an office job and did not have any recent trauma, sports participation, or prior local injury. Physical and neurological examination (including the range of motions, sensory, motor, and reflex testing) was unremarkable. An ultrasound examination was arranged to investigate the cause of unrelenting left posterior hip pain. What is your initial impression based on the ultrasound images [Figure 1]?

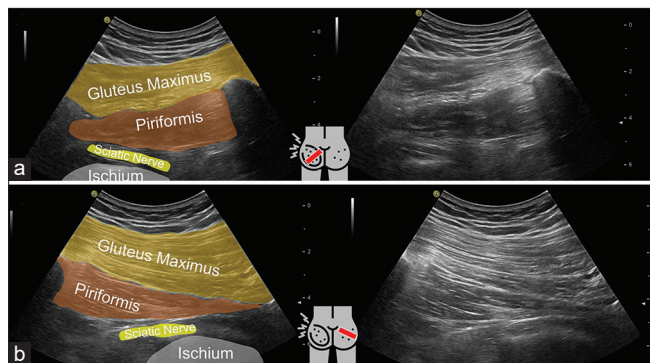


Figure 1: Ultrasound images of the posterior hip showed increased thickness, loss of perimysium, and blurred border of the left piriformis muscle (a). Normal side (b)

INTERPRETATION

With the patient lying prone, a curvilinear transducer was positioned over the sacrum and angled inferiorly/laterally toward the greater trochanter to obtain the long-axis view of the piriformis muscle. The side-to-side comparison showed thickening and hypoechoic changes in the left piriformis muscle [Figure 1]. The muscle border also appeared blurred on the affected side. Dynamic ultrasound examination (during passive internal rotation of the hip with the knee at 90° of flexion) showed compression of the sciatic nerve by the piriformis muscle – also reproduced the pain described by the patient. Ultrasound-guided 10 mL 25% dextrose (mixed with lidocaine) injection was performed on the piriformis

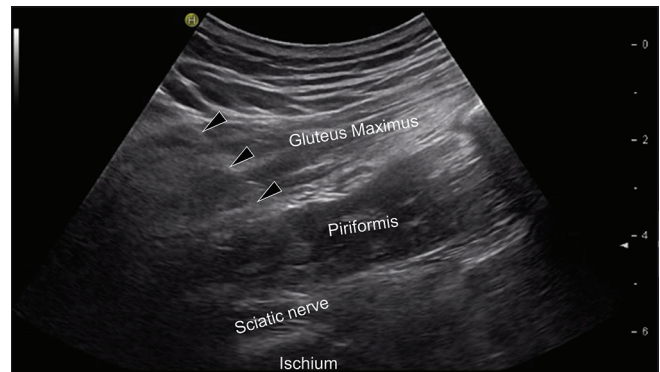


Figure 2: Triamcinolone and lidocaine injection to the inflamed left piriformis muscle under ultrasound guidance. Arrowheads show the needle

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muscle [Figure 2]. Twitching of the gluteus maximus and piriformis muscles was observed during the injection [Video 1]. The patient reported significant pain relief (the visual analog scale score decreased from 8 to 2) 2 weeks later.

DISCUSSION

The piriformis muscle originates from the anterior surface of the sacrum, crossing the greater sciatic notch caudally and laterally to insert into the greater trochanter.^[1] Along with other posterior hip muscles, it primarily functions as an external rotator during hip extension but acts as an adductor when during hip flexion. Immediately anterior to the piriformis muscle, the lumbosacral plexus gives rise to the sciatic nerve. In case the piriformis is overused, inflamed, or spastic; it can irritate the adjacent sciatic nerve, resulting in “piriformis syndrome.” Hip trauma, prolonged sitting, and vigorous training can all predispose to the condition. The nerve may also become compressed by a bipartite piriformis muscle.^[2] Patients often complain of pain in the hip as well as stabbing, burning, or tingling sensations radiating to the leg.^[3] Sensory abnormality and weakness may be observed simultaneously. Of note, the pain usually prevents the patient from sitting or walking for a long time. Although piriformis muscle syndrome is possibly disabling in the acute phase, its prognosis is generally good.

Piriformis syndrome is largely a diagnosis of exclusion. In this sense, there has always been debate as regards the condition being under or overdiagnosed.^[4] Herein, the other causes of sciatica encompass herniated lumbar disc, spinal stenosis, osteophyte formation, and spondylolisthesis. Entrapment of the sciatic nerve around this area may also occur from endometriosis, tumor invasion (e.g., sarcoma, schwannoma, and osteochondroma), hematoma, or inferior gluteal artery aneurysm.^[5,6] Stretching and deep palpation of the piriformis muscle can provoke the symptom(s); however, their diagnostic accuracy does vary.^[7] Computed tomography and magnetic resonance imaging (MRI) are useful in exploring multiple etiologies, but they are quite costly. Patients with piriformis syndrome have significantly increased thickness and cross-sectional area of the muscle on the symptomatic side under ultrasound imaging.^[7,8] Furthermore, inflammation and edema of the piriformis muscle result in decreased echo intensity and blurred muscle edge(s).^[8] Dynamic testing may reveal sciatic nerve compression by the piriformis muscle or jerky movements of the pathogenic muscle.^[9] Ultrasound-guided injections with analgesics, steroids, or botulinum toxin may help decrease pain, inflammation, and muscle spasms. Prolotherapy stimulates tissue repair and remodeling by causing transient local inflammation. Improvement of myofascial pain syndrome is seen after dextrose injection.^[10] If local twitch responses are elicited during the intervention, the presence of trigger points needs to be considered within the muscle. Eventually, if symptom improvement is achieved after the injection, piriformis

syndrome can be ascertained. If not, advanced imaging such as MRI should be arranged to rule out other differential diagnoses.

Although its definite diagnosis is often challenging and at times controversial, ultrasound imaging seems to be contributory to the prompt management of piriformis syndrome. Notably, a side-to-side comparison would exhibit thickening and altered echotexture of the symptomatic piriformis muscle. A dynamic examination can further show the actual scenario of pain and compression. Last but not least, various diagnostic/therapeutic interventions can be performed under ultrasound guidance as well.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent form. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

Dr. Ke-Vin Chang, an editorial board member at *Journal of Medical Ultrasound*, had no role in the peer review process of or decision to publish this article. The other authors declared no conflicts of interest in writing this paper.

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