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Entrapment neuropathy, among the most common causes of focal neuropathy, can occur when a peripheral nerve passes through a ligament, osseofibrous tunnel, or muscle. Piriformis syndrome is thought to result from compression of the sciatic nerve around the piriformis muscle. Rhabdomyolysis can cause muscle degeneration and swelling, the latter of which can lead to peripheral nerve compression. Sciatic neuropathy due to piriformis rhabdomyolysis is extremely rare.

## CASE REPORT

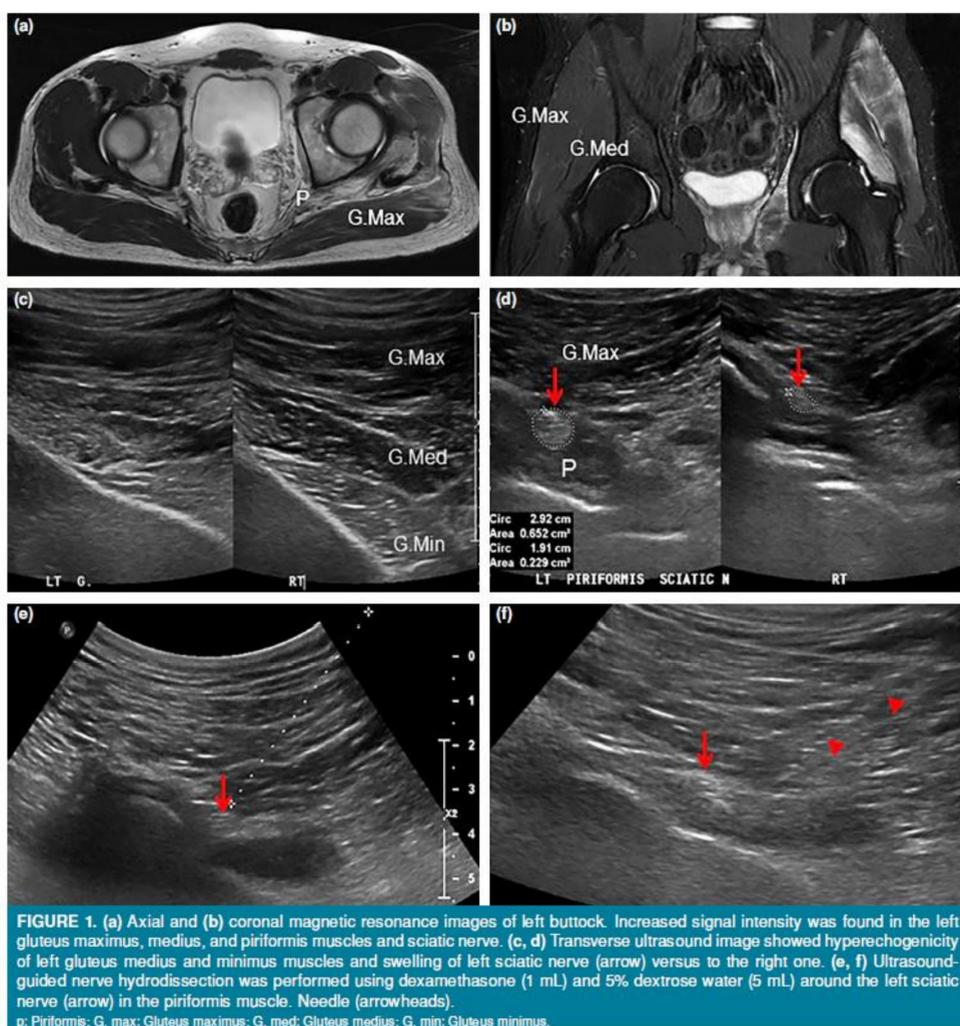
A 27-year-old male patient was admitted to our rehabilitation department with severe left buttock pain radiating to the sole which developed after rock climbing 12 days prior. The day after the patient went rock climbing, he visited an external clinic with severe left buttock pain. An evaluation revealed that his serum creatine kinase (CK) level was elevated at 14,928 IU/L. After intensive hydration therapy, the serum CK level normalized to 74 IU/L, but the painful weakness of the left lower extremity persisted.

Upon admission to our department, the Visual Analog Scale (VAS) score of the left buttock pain radiating to the sole was 7. The Manual Muscle Testing (MMT) revealed a Medical Research Council (MRC) Grade 3 in the left knee flexor, MRC Grade 4 in the left ankle plantar flexor and hip extensor, MRC Grade 4 in the left ankle dorsiflexor, and MRC Grade 4+ in the left hip abductor. The strengths of the other muscles in the left lower extremity were normal. In the sensory test, hypesthesia and hypoalgesia of the dorsum of the left foot were provoked by light touch and pinprick, and paresthesia of the left sole and fifth toe were induced by pinprick. Deep tendon reflexes were absent in the left ankle. The patient could not walk independently due to pain and weakness of the left buttock and lower extremity.

Pelvic magnetic resonance imaging (MRI) demonstrated edematous changes in the left gluteus maximus, medius, and minimus muscles; piriformis muscle; and soft tissues around the left sciatic nerve (Figure 1). The ultrasound (US) showed hyperechogenicity in the left gluteus medius, minimus, and piriformis muscles and swelling of the left sciatic nerve in the upper portion of piriformis muscle versus the right one. A nerve conduction study showed low-amplitude compound muscle action potentials (CMAPs) of the left tibial and common peroneal nerves, sensory nerve action potential (SNAP) of the left sural nerve, and H-reflex of the left gastrocnemius muscle. However, no remarkable difference was noted in the latency of the H-reflexes between the two gastrocnemius muscles (Table I). Needle electromyography revealed abnormal spontaneous activity in the left gluteus maximus and medius, tibialis anterior, peroneus longus, gastrocnemius, semimembranosus, and short head of the biceps femoris muscles. Electrodiagnostic findings revealed left incomplete sciatic neuropathy with gluteal myopathy. Based on all these findings, the patient was diagnosed with sciatic neuropathy caused by piriformis rhabdomyolysis. The patient underwent US-guided sciatic nerve hydrodissection. Ultrasound-guided nerve hydrodissection was performed by the injection of dexamethasone (5 mg, 1 mL) and 5% dextrose water (5 mL) around the left sciatic nerve in the piriformis muscle (Figure 1).

The MRC grade of the left knee flexor increased from 3 to 4 and the VAS score decreased from 7 to 5 on the day after injection. At two weeks post-injection, the VAS score of the left buttock pain radiating to the sole was 5, and muscle strength increased to MRC Grade 4 in the left knee flexor, hip extensor, and ankle plantar flexor muscles. Meanwhile, the patient was able to walk indoors independently. Five months post-injection, the VAS score was 1 and the muscle strength increased to MRC Grade 4+ in the left ankle plantar flexor and Grade 5 in the other left lower-extremity muscles. In addition, the patient resumed his previous functional activities. A follow-up nerve conduction study showed increased-amplitude CMAPs in the left tibial and common peroneal nerves and an increased SNAP in the left sural nerve (Table I).

**In conclusion**, this case is the first known case of successful treatment of sciatic neuropathy due to piriformis rhabdomyolysis using US-guided sciatic nerve hydrodissection. Although peripheral entrapment neuropathy due to rhabdomyolysis is rare, its early diagnosis and treatment using US-guided nerve hydrodissection may prevent severe neurological complications and yield favorable clinical outcomes.



**FIGURE 1.** (a) Axial and (b) coronal magnetic resonance images of left buttock. Increased signal intensity was found in the left gluteus maximus, medius, and piriformis muscles and sciatic nerve. (c, d) Transverse ultrasound image showed hyperechogenicity of left gluteus medius and minimus muscles and swelling of left sciatic nerve (arrow) versus to the right one. (e, f) Ultrasound-guided nerve hydrodissection was performed using dexamethasone (1 mL) and 5% dextrose water (5 mL) around the left sciatic nerve (arrow) in the piriformis muscle. Needle (arrowheads).

**TABLE I**

Initial and follow-up nerve conduction studies for incomplete left sciatic neuropathy

Nerve	Left			Right		
	Distal latency (ms)	Amplitude (μV)	Velocity (m/s)	Distal latency (ms)	Amplitude (μV)	Velocity (m/s)
SNAP						
Sup. peroneal	1.96	9.9		1.88	9.6	
Sural	1.88	9.2		1.93	21.2	
Saphenous	1.61	11.5		1.77	12.5	
CMAP						
Com. peroneal	3.54	2.5	46.1	3.13	10.0	45.3
Tibial	4.27	5.7	45.7	3.65	18.2	50.0
Femoral	5.26	13.7		5.16	15.1	
H-reflex						
Tibial	31.61	0.5		31.25	12.7	
SNAP						
Sup. peroneal	1.82	9.9				
Sural	2.19	9.6				
CMAP						
Com. peroneal	3.39	6.4	42.9			
Tibial	3.44	6.3	41.9			

Amp: Amplitude; CMAP: Compound muscle action potential; Com.: Peroneal, common peroneal; DL: Distal latency; SNAP: Sensory nerve action potential; Sup.: Peroneal, superficial peroneal.