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CASE REPORT

# Radiologic and pathologic evaluation for a large schwannoma of the sciatic nerve: A neglected cause of sciatica

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**SUMMARY**

Schwannomas are benign tumors originating from the peripheral nerve sheath. Although they rarely involve the sciatic nerve, their presence may result in sciatica, a condition characterized by pain radiating along the course of the sciatic nerve from the buttock or gluteal region. Despite being an uncommon cause of sciatica, sciatic nerve schwannomas present diagnostic challenges and management complexities. Their occurrence within the sciatic nerve is frequently overlooked, underscoring the need for accurate diagnosis and individualized therapeutic strategies. Surgical intervention is the primary treatment modality for sciatic nerve schwannomas and is associated with highly favorable outcomes when an appropriate surgical approach is employed. In this report, we present a case of chronic sciatica caused by a large schwannoma. Our aim is to emphasize the critical role of comprehensive imaging techniques and meticulous pathological evaluation in achieving an accurate diagnosis and guiding effective treatment planning in such cases.

**Keywords:** Buttock pain; neurilemma; neurofibroma; sciatica; ultrasound.

## Introduction

Schwannomas, originating from Schwann cells within the peripheral nervous system, are benign tumors.[1] Among adults, they are the most prevalent tumors affecting the peripheral nerve sheath.[2] Sciatica refers to pain radiating through the buttock, posterior thigh, and leg along the course of the sciatic nerve and its branches.[3] Although the sciatic nerve is the largest nerve in the human body, schwannomas arising from this nerve are exceptionally rare and represent an uncommon cause of sciatica.[1,2] The tendency to prioritize more common etiologies of sciatica may hinder the accurate diagnosis and effective management of sciatic nerve schwannomas.[1,3]

To address this diagnostic challenge, ultrasonography has emerged as a pivotal and valuable diagnostic tool, complementing patient history and physical examination.[2,4] In this context, we present a case report of chronic sciatica caused by a large schwannoma, emphasizing the advantages of various imaging modalities in achieving accurate diagnosis and guiding optimal management strategies.

## Case Report

A 37-year-old female patient presented with exacerbated right hip pain aggravated by prolonged sitting and standing. The pain originated in the right buttock and radiated down the posterior thigh and calf, extending to the foot. Additionally, the patient reported generalized numbness and tingling throughout the entire foot. These symptoms had persisted for 1–2 years but had intensified notably over the preceding three months. The patient denied any family history of cancer, pre-existing medical conditions, or trauma to the affected area. She had previously received diagnoses of lumbar disc

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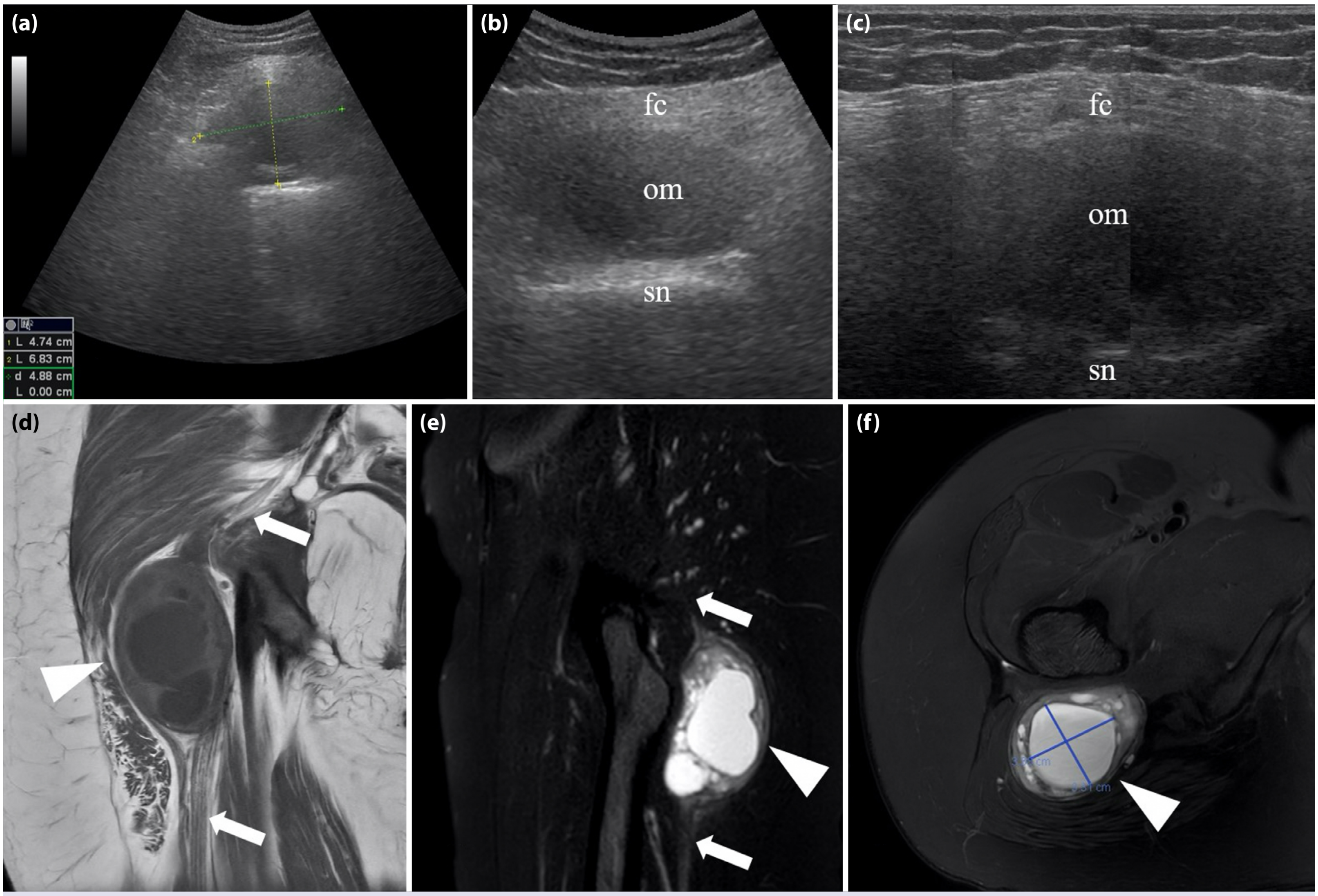


**Figure 1.** Axial ultrasound imaging with a convex probe **(a, b)** and a linear probe **(c)** demonstrates a hypoechoic oval mass adjacent to the sciatic nerve with its hyperechoic fibrillar capsule. Coronal T1-weighted **(d)**, sagittal T2-weighted **(e)**, axial T2-weighted **(f)** MRI sequences of a well-defined encapsulated peripheral nerve sheath tumor between gluteal and adductor muscles in the posterior upper third of the thigh.

White arrowheads: Schwannoma; White arrows: Sciatic nerve; fc: Fibrous capsule; om: Oval mass; sn: Sciatic nerve.

herniation, myofascial pain syndrome, and piriformis syndrome during earlier medical evaluations. Although she initially responded to nonsteroidal anti-inflammatory drugs (NSAIDs), their efficacy had diminished over time.

On physical examination, pressure applied to the posterolateral region of the right hip elicited pain and paresthesia. Although the Tinel sign was positive, no palpable mass was detected in the affected area. Neurological examination, including assessment of lower extremity range of motion, muscle strength, sensation, and deep tendon reflexes, revealed no significant abnormalities.

Using a convex probe, ultrasonographic evaluation of the right posterior thigh demonstrated an oval cystic mass located adjacent to the sciatic nerve. The well-defined, encapsulated mass measured 4.74 cm×6.83 cm (Fig. 1a, b), showed no significant increase in Doppler signal, and appeared as a hypoechoic encapsulated lesion with a central hypoechoic area. Due to the size of the mass and the anatomical characteristics of the examination region, a linear probe was insufficient for comprehensive evaluation, necessitating acquisition of multiple images to better delineate the encapsulated and well-demarcated structure (Fig. 1c).

Subsequent magnetic resonance imaging (MRI) revealed a 6.8 cm×4.4 cm encapsulated peripheral nerve sheath tumor with a cystic-mucoid component distal to the sciatic notch, located between the gluteal and adductor muscles (Fig. 1d). Diffusion-weighted imaging (Fig. 1e, f) demonstrated mild diffusion restriction in areas excluding the cystic-mucoid component.

An ultrasound-guided biopsy confirmed the diagnosis of schwannoma (Fig. 2). As atypical neurofibro-

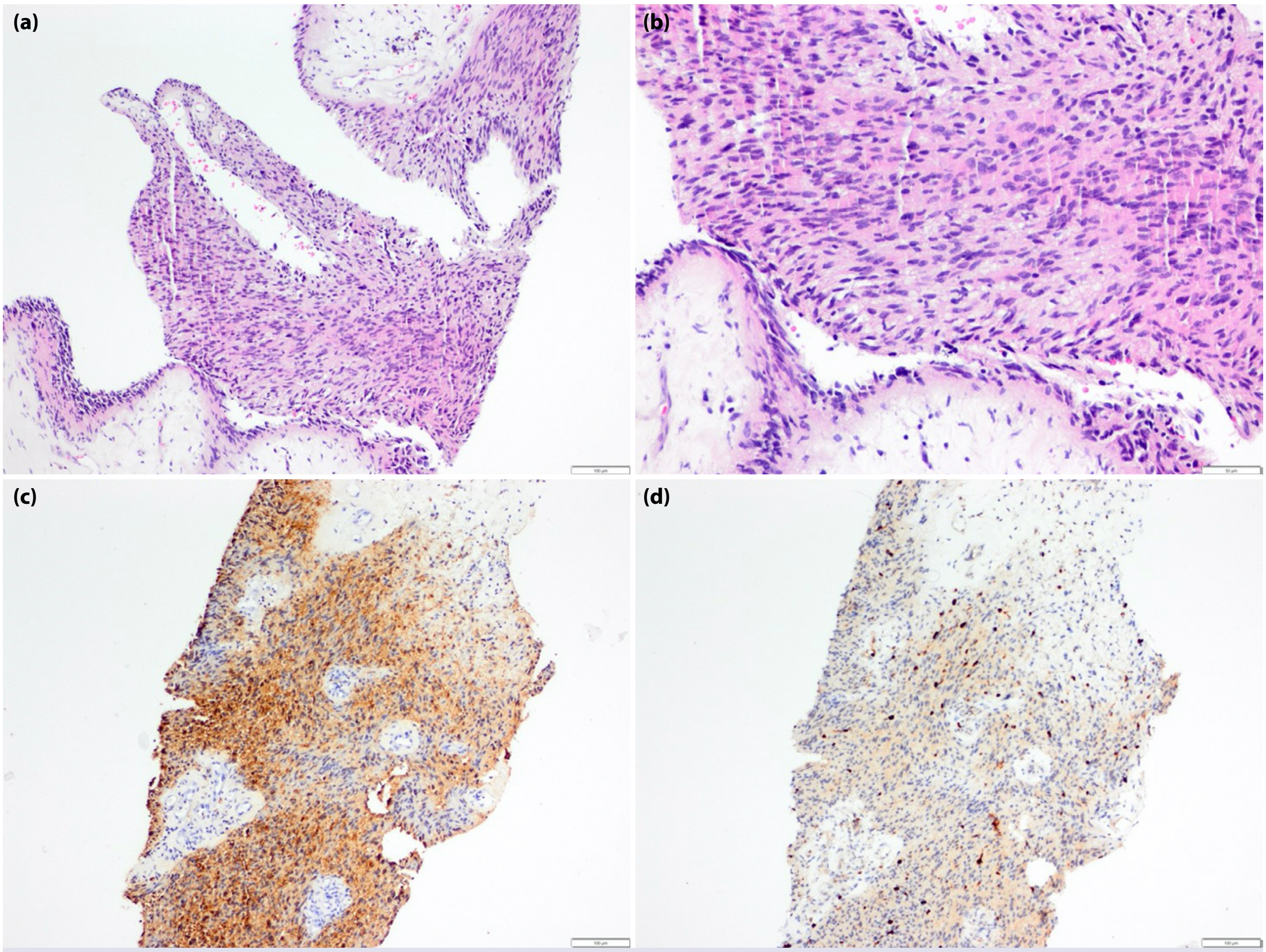


**Figure 2.** Histopathology showing hypocellular, edematous and cystic areas among hypercellular regions. No necrosis and mitosis are detected. At the top right and in the middle of the picture, Verocay bodies are seen, consisting of two nuclear palisade regions and the nuclear region between them **(a)**. Neoplastic cells have ovoid-spindled nuclei, fine chromatin, eosinophilic and vacuolated cytoplasm. Some of the cells have prominent nucleoli, enlarged and hyperchromatic nuclei **(b)**. Neoplastic cells are diffuse positive with S100 immunohistochemical staining **(c)**. Immunohistochemically, Ki67 proliferation index is up to 5–10% at focal areas **(d)**.

matous neoplasia could not be definitively excluded, conservative excision of the mass was recommended by the pathology department. The patient was subsequently referred to the neurosurgery department for planned surgical excision. Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

## Discussion

The differential diagnosis of sciatica includes lumbar disc herniation with nerve compression, degenerative spinal conditions, facet syndrome, spinal tumors, biceps femoris strain or hematoma, sciatic neuritis, piriformis syndrome, pelvic tumors, endometriosis, and peripheral nerve sheath tumors.[1,3,5] In addition, numerous other conditions may present with clinical features similar to sciatica.[3,5] Lumbar disc herniation and degenerative spinal disease are typically the primary considerations in patients presenting with sciatic symptoms.[3] Alongside these common etiologies, piriformis syndrome represents a notable entity that is reported to be both overdiagnosed and underdiagnosed according to different perspectives in the literature.[6,7] This syndrome involves compression of the sciatic nerve and its branches by the piriformis muscle and underscores the importance of ultrasonography in both its diagnosis and management.[8] Ultrasonography not only guides diagnostic injections, which are important in confirming piriformis syndrome, but also facilitates detection of masses exerting pressure on the sciatic nerve or abnormalities within the nerve itself.[9] Moreover, it enables evaluation of the musculature and adjacent tissues in the symptomatic region.[9,10]

In our patient's clinical history, exacerbation of pain during prolonged sitting and the localized origin of pain prompted ultrasonographic evaluation. Identification of a cystic, oval mass adjacent to the sciatic nerve subsequently led to the diagnosis of schwannoma based on its well-defined borders and absence of central necrosis. In contrast to schwannomas, neurofibromas are malignant peripheral nerve sheath tumors characterized by larger size, irregular margins, central necrosis, and infiltrative growth into surrounding tissues.[1,11] Notably, power Doppler ultrasonography is not reliable for differentiating schwannomas from neurofibromas.[2,4]

Magnetic resonance imaging (MRI) is considered the gold standard imaging modality for the diagnosis of schwannomas. These lesions typically appear as well-circumscribed oval masses that are isointense on T1-weighted images (Fig. 1d) and hyperintense on T2-weighted images (Fig. 1e, f), causing expansion along the course of the sciatic nerve.[1] Although MRI provides comprehensive anatomical detail and is valuable for surgical planning, ultrasonography plays a crucial role in alleviating patient concerns regarding diagnosis and facilitating biopsy procedures required for definitive confirmation. Furthermore, intraoperative use of ultrasonography may enhance surgical accuracy and improve clinical outcomes.[1] Despite the relatively large size of the mass in our case, its encapsulated structure, well-defined margins, and absence of central necrosis allowed for a preliminary diagnosis of a benign peripheral nerve sheath tumor. A review of 23 case reports published over the last 15 years indicates that while some sciatic nerve schwannomas may reach sizes of 9, 11, or even 15 cm, most cases typically measure between 3–5 cm.[1] Nevertheless, pathological confirmation remains essential for the definitive diagnosis of peripheral nerve sheath tumors, given the inherent limitations of imaging modalities.[1,12] Although the risk of malignant transformation in schwannomas is low, at approximately 5%, complete surgical excision remains the most appropriate treatment approach for peripheral nerve sheath tumors.[1,2]

The schwannoma in our case was located in the upper one-third of the sciatic nerve, as reported in approximately half of the cases in the literature.[1] Almost all reported cases present with sciatic pain, and our case is consistent with the literature in this respect. While the presence of Tinel's sign is in accordance with previous reports, the absence of a palpable mass—despite the lesion measuring approximately 9cm—distinguishes our case from others.[1] A palpable mass was not detected in cases reported by Kralick et al.[13] (3.5 cm), Haspolat et al.[14] (4 cm), Mansukhani et al.[15] (2.5 cm), Munakomi et al.[16] (3 cm), Guedes et al.[5] (3 cm), and Telera et al.[1] (3 cm). In this regard, the absence of a palpable mass despite the large size of the lesion suggests that sciatic schwannomas may be difficult to diagnose without imaging, even as they increase in size.

Although the duration of symptoms varies widely in the literature, ranging from 1 to 120 months, the onset of symptoms in our patient was consistent with the commonly reported duration of approximately two years.[1] The relationship between tumor size and time to diagnosis remains unclear.[1] For example, the 9 cm mass reported by Godkin et al.[17] was diagnosed within 8 months, whereas the 8.5 cm mass described by Blanchard et al.[18] was diagnosed after 84 months. Factors other than tumor size, such as geographic location, access to healthcare facilities, and diagnostic approaches, likely contribute to these variations.

When sciatic schwannomas reported in the literature are evaluated collectively, it should be noted that Tinel's sign may be absent, a palpable mass may not be detected, and the condition may be confused with a wide range of other diagnoses.[1] The most effective way to overcome these diagnostic challenges is to consider schwannoma in the differential diagnosis and to proceed with ultrasonography as the initial imaging modality, followed by MRI for definitive evaluation. Subsequent pathological examination and surgical excision form the basis of optimal treatment management.[1,2,12]

## Discussion

Sciatic nerve schwannomas, although rare, should be considered in cases of persistent, unexplained sciatica. The limitations of physical examination during the diagnostic phase, together with restricted access to advanced imaging modalities such as MRI, underscore the importance of ultrasonographic evaluation as an accessible and valuable diagnostic tool.

**Ethics Committee Approval:** This is a single case report, and therefore ethics committee approval was not required in accordance with institutional policies.

**Informed Consent:** Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

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**Peer-rewiew:** Externally peer-reviewed.

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