A rare cause of non discal sciatica: Schwannoma of the sciatic nerve


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Summary
Schwannomas are peripheral nerve sheath tumors. Schwannomas arising in the sciatic nerve are considered a rare condition. Their symptomatology usually mimics sciatic pain due to a herniated disc, which can delay the diagnosis. We report the case of a patient with chronic sciatica in whom Magnetic Resonance Imaging (MRI) examination of the right thigh revealed a tumor of the sciatic nerve. Excision of the tumor was easily performed without neural lesioning. Histopathological examination revealed the tumor to be a schwannoma. No neurologic deficit was noted postoperatively which confirms the good prognosis of this tumor.

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Introduction
Schwannoma, also called neurinoma or neurilemmoma, is a benign peripheral nerve sheath tumor arising from Schwann's cells. Schwannomas are the most common peripheral nerve sheath tumors [1–4]. Schwannomas of the sciatic nerve are very rare (1%) and may raise confusion in diagnosis with late discovery of the tumor [1,3]. In the present observation, we report a case of sciatic nerve schwannoma revealed by chronic sciatica in a young adult and discuss the interest of imaging examination in the diagnosis of this benign tumor.

Observation
A 42-year-old patient, with no previous medical history, presented with pain of one-year duration that radiated from the posterior aspect of the right thigh to the lateral aspect of the leg and right foot and associated with numbness of right lower limb, without trauma. This patient had already undergone lumbar Magnetic Resonance Imaging (MRI), which had not revealed any particular anomaly. On neurologic examination, no obvious motor or sensory deficit was noted. Osteotendinous reflexes and range of motion were normal. Biological analysis failed to exhibit any anomaly. Further questioning combined with palpation of the posterior aspect of the right thigh elicited an isolated oblong soft-tissue mass sensitive to percussion, which had been gradually increasing in size for more than one year but
Figure 1  Magnetic Resonance Imaging (MRI) coronal T1-weighted image of the posterior aspect of the right thigh: fusiform lesion of homogeneous isosignal intensity.

never mentioned by the patient. Standard radiographs were normal and did not reveal any bone anomaly. MRI of the right thigh showed an ovoid expansive mass of 50 mm height along the right sciatic nerve, of isosignal intensity to muscle on T1-weighted images (Fig. 1), and heterogenous high signal intensity on T2-weighted images (Fig. 2). The mass was enhanced heterogeneously after injection of gadolinium (Fig. 3). Schwannoma of the right sciatic nerve was thus diagnosed. Complete excision of the tumor was then performed (Fig. 4). Examination revealed the excised mass to be well-encapsulated, of whitish appearance, adherent to the sciatic nerve, excentrically located on the nerve and easily removable. It repulsed fascicular groups without penetrating them and a cleavage plane was found along the interface between the tumor capsule and nerve fibers thus allowing a complete macroscopic excision with no interruption in the continuity of the sciatic nerve (Fig. 5). The postoperative period was simple with no signs of neurological deficit. At last follow-up, one year postoperatively, no tumor recurrence was noted.

Figure 2  Magnetic Resonance Imaging (MRI) sagittal T2-weighted image of the posterior aspect of the right thigh: well-encapsulated, fusiform mass of heterogeneous high-signal intensity. This plane accurately demonstrates the continuity between the mass and the sciatic nerve.

Figure 3  Magnetic Resonance Imaging (MRI) coronal gadolinium-enhanced T1-weighted image: high-intensity and heterogeneously enhanced lesion.

Figure 4  Intra-operative view: tumor enucleation and visualisation of the sciatic nerve.
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Peripheral nerve tumors are rare conditions. They arise from the sheath of the nerve, which in turn originates from the neurectoderm and neural crest. Schwannomas are the most common peripheral nerve sheath tumors [2]. They generally affect the main trunk of the nerve, more specifically in the upper limb. The posterior tibial nerve at the tarsal sinus is the most frequently involved nerve of the lower limb [1,4]. Involvement of the sciatic nerve is rare and represents less than one over 100 cases. The nerve might be affected by the tumor all along its course [3].

Schwannomas most commonly occur in adults between 20 and 50 years of age, without distinction of gender, with an approximate one sex ratio [1,2]. They generally appear as solitary lesions. Occurrence of multiple schwannomas is rare and not necessarily correlated with neurofibromatosis, which demonstrates very precise chromosomal alterations [5–7]. Malignant transformation of benign schwannomas is unusual [3,5].

The most common clinical presentation of sciatic nerve schwannoma consists of a painful palpable mass [8,9]. Other clinical symptoms include radicular and distal pains often distant from the lesion site, paraesthesia, hypesthesia and rarely motor deficiencies. Pain is often attributed to distal sciatica but there is no impulse at cough and a mass sensitive to percussion is detected at palpation of the nerve course [2]. Aetiologic investigation late reveals a schwannoma of the sciatic nerve since it is often combined with a radicular pain similar to sciatic due to a herniated disk while imaging of the spine might reveal a moderate discopathy wrongly considered as responsible for symptoms [1–3]. In our observation, clinical symptom consisted of chronic sciatica and imaging of the spine was normal.

Ultrasonography revealed a hypoechoic mass, excentrically located on the affected nerve which fibrillar aspect was preserved. At cross-sectional imaging using Color Doppler, it was found to be round and often hyperaemic. The main lesion to be considered in the differential diagnosis is neurofibroma, which unlike schwannoma, appears as a solid and well-centered mass on the affected nerve which fibrillar aspect completely disappears [9–12].

Three-dimensional high contrast resolution MRI offers better discrimination of soft-tissue than CT scan. It accurately depicts the tumor and its extent [13,14]. The schwannoma is excentrically located on the nerve, and appears of isosignal intensity on T1-weighted images and of hypersignal intensity on T2-weighted images. This is a well-circumscribed mass which peripheral rim is of hyposignal intensity thus suggesting the presence of a capsule. Gadolinium signal enhancement is usually homogeneous except in cystic or necrotic lesions or in case of giant tumors [4,7,14]. In most cases, MRI allows differentiation between schwannomas and neurofibromas. Actually, the rounded aspect, peripheral hyperintensity and more or less homogenous hypointense center on T2-weighted images are characteristic features of schwannoma whereas neurofibroma is usually heterogeneous or rarely homogeneous on both T1- and T2-weighted images [1,7,15]. Such distinction between neurofibroma and schwannoma is important since neurofibroma deeply affects the nerve thus requiring complete resection with functional consequences whereas schwannoma might be resected without loss of nerve continuity [10,13].

A variety of expansive lesions might also originate from the sciatic nerve and lead to mistaken diagnoses such as fibrolipomatous hamartoma, a rare benign tumor, which might progressively reach a significant size in the pelvis with no other clinical symptom than compression of the neighbouring organs [10].

Other rare nerve tumors might develop from the constitutive elements of the nerve such as intra-nervous lipoma, hemangioma of Schwann’s sheath and neurofibrolipoma.

Mucoid cysts are rare and benign tumors which can arise from all peripheral nerves near joints and which should be suspected when facing rapid occurrence of neural lesion near joints. Pre- and postoperative search for communication with the neighbouring joint should be performed especially to reduce the risk of recurrence [11,16].

Malignant neural tumors have different clinical manifestations and a bad prognosis. They are initially painful and rapidly growing tumors often associated with neurologic deficit. MRI is the most efficient tool for diagnosis of these tumors. However, only histological investigation will provide accurate diagnosis [13].

Surgical excision is the treatment of choice. Schwannomas are theoretically removable since they repulse fascicular groups without penetrating them thus allowing their enucleation while preserving nerve continuity [3–5,9,10], as reported in our patient. Microsurgical excision should be performed using electrical stimulation to facilitate detection of motor fascicles. The sciatic nerve fascicles might sometimes be incorporated peripherally on the tumor capsule thus requiring to be sacrificed [4,13].

Finally, one should consider the medico-legal consequences of an incomplete tumor excision or resection of a major nerve for a benign tumor since the neural graft subsequently associated with muscular transfer only provide partial recovery of deficits [13].

This tumor has a good prognosis and a low incidence of recurrence and malignant transformation unlike neurofibromatosis [2].

Discussion

Macroscopic aspect of the mass after complete surgical excision.

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Conclusion

Schwannomas of the sciatic nerve are rare and well-delineated tumors, excentrically located on the nerve. Although rare, schwannoma of the sciatic nerve should be systematically suspected if persistent sciatica is reported in young adults with no signs of radicular compression at imaging. Slice imaging, especially MRI, can help improve detection and perform differential diagnosis between schwannoma and neurofibroma. However, diagnosis should be histologically confirmed.

Conflicts of interests

No conflicts of interests.

References