

AN OCCULT SCHWANNOMA OF THE DEEP PERONEAL NERVE PRESENTING WITH NEURALGIA MIMICKING SCIATICA: CASE REPORT AND REVIEW OF THE LITERATURE

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The common peroneal nerve and its branches innervate the muscles of dorsiflexion-inversion of the foot via the deep peroneal nerve, and the muscles of eversion-plantar flexion of the foot via a superficial peroneal nerve. The principal morbidity due to their disturbance is the foot drop. Owing to their peculiar superficial course around the posterolateral aspect of the head-neck of the fibula, traumatic injuries are far more common than nontraumatic lesions. Various forms of traumatic lesions of these nerves account for more than 90% of morbid cases.^{1,2} Among the nontraumatic lesions which make up fewer than 10% of their pathological lesions, ganglion cysts, focal hypertrophic lesions, and peroneal nerve entrapment syndromes are frequently seen.^{3,4} Solitary benign or malignant peripheral nerve sheath tumors of these nerves unassociated with neurofibromatosis-1, or prior radiation therapy for malignant lesions of other soft tissues, however, are relatively rare.⁴

We present an interesting case of a schwannoma of the deep peroneal nerve in the middle of the anterior compartment of the leg presenting with neuralgia, which was construed as a case of sciatica due to a lumbar disc prolapse. The clinical findings are described and discussed.

Case Report

A 52-year-old man presented with complaints of recurrent episodes of lancinating pains in the anterolateral aspect of the left leg and the foot, with heaviness in the posterior aspect of the thigh for the previous three months. He had recently developed a weakness of the dorsiflexion of the foot. He gave a history of intermittent low back pains since the age of 35 years. He had had high blood pressure and diabetes mellitus for more than 10 years and

these were under control with appropriate medications. He also gave a history of sudden loss of consciousness about three years previously, and had been on ventilator in the Neuro-Intensive Care Unit for two weeks, where he made a progressive recovery. He was diagnosed with basilar artery thrombosis and was put on anticoagulant therapy. For the recurrent pains, he had been unsuccessfully treated as a case of lumbar disc prolapse at L₄-L₅ level in the orthopedic clinic at another institution with analgesics, bed rest and physiotherapy. MRI showed degenerative disc changes in the lumbar region and a generalized disc bulge at L₄-L₅ level but no focal disc prolapse.

On clinical examination, the patient's vital parameters were normal. The higher mental functions, fundi and cranial nerves were normal except a residual mild left facial palsy. He had generalized hypertonia and hyperflexia in the limbs, right upgoing plantar response, left equivocal plantar response, and a weak dorsiflexion of the left foot. The straight leg-raising test was restricted on the left side due to pain. A tender spot was noted in the left mid-leg just lateral to the tibial shin. There was a small, barely palpable side-to-side mobile swelling, measuring about 6-8 mm in diameter. The skin over the swelling was normal. Manipulation of the swelling during examination had triggered the lancinating pains in the left lower limb, especially in the leg and the foot, and these were reproducible, lasting for a few seconds.

Under local anesthesia, a small vertical skin incision was made and subcutaneous tissue was incised and retracted. The firm fibrous sheath of the anterior compartment was incised, and the tibialis anterior muscle was separated from the extensor hallucis longus and extensor digitorum longus muscles to reveal an 8-mm swelling attached to the lateral aspect of the deep peroneal nerve, which was crossing just lateral to the anterior tibial vessels. Microscopic dissection showed its attachment to a fascicle of the deep peroneal nerve fibers. It was an encapsulated solitary soft tumor, which was completely excised with preservation of the deep peroneal nerve. The postoperative course was uneventful, and the patient was completely relieved of his lancinating pains and regained his fully normal dorsiflexion of the foot. Histopathological

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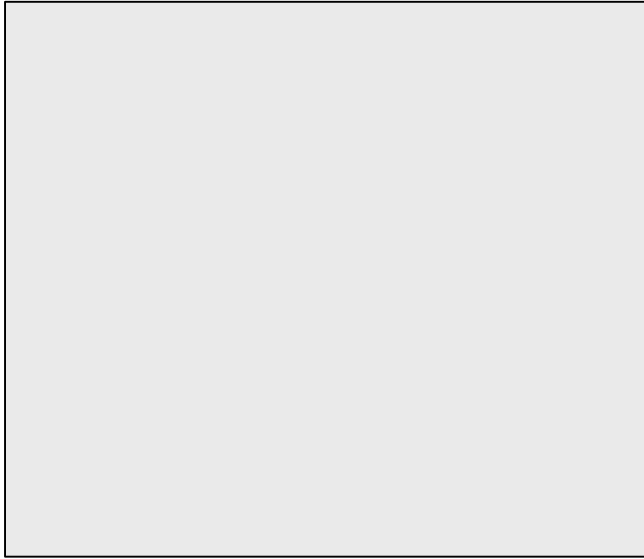


FIGURE 1. Photomicrograph showing features of a benign neoplasm composed of bundles of spindle cells with varying cellularity and nuclear palisading. No mitosis or necrosis are seen (H&E, 40x).

examination showed features of a schwannoma (Figure 1). The patient was asymptomatic when seen three years after surgery.

Discussion

Due to its superficial anatomical oblique course along the posterior aspect of the head-neck of the fibula, the common peroneal nerve is extremely vulnerable to traumatic injuries such as blunt trauma, stretching forces, lacerations or external compression due to abnormal position, bandages and plaster casts.^{1,2} Traumatic peroneal palsies associated with severe knee injuries are not uncommon in athletes and individuals injured in vehicular accidents.⁴ Peroneal nerve injuries vary from the reversible neuropraxic lesions seen with a prolonged cross-legged position (movie-house foot drop), to severe stretch avulsion injuries seen in association with ligamentous tears or fractures, or dislocations of the knee. In peroneal nerve injuries, there will be a foot drop, resulting in a “slapping” foot gait, as well as inability to extend the toes, especially the great toe, and to evert the foot. This results in “steppage gait.”^{5,6}

Over the years, much attention has been given to peroneal nerve injuries and less attention to tumors of the peroneal nerve. Functional disability resulting from peroneal nerve impairment can be profound, so it is important that we improve our understanding of the clinical issues related to the pathology of the common peroneal nerve and its branches.^{4,7}

Among the various swellings associated with the peroneal nerves, ganglion cysts and focal hypertrophic neuropathy are relatively common.^{4,6,8,9} Schwannomas, neurofibromas and neurogenic sarcomas are uncommon

peroneal nerve lesions, and in more than 50% of cases these occur in association with neurofibromatosis-1, or follow radiation therapy for malignant lesions of other soft tissues.^{4,7} These latter lesions especially involve the common peroneal nerve in the thigh or at the knee, rather than the deep or superficial peroneal nerves in the legs.

Schwannomas usually occur along the flexor aspect of the extremities, particularly around the wrists, elbows and knees. A few schwannomas occur in the anterior neck, and infrequently on the trunk. In none of the 246 cases reviewed by Stuet did they occur on the feet or involve the deep peroneal nerve in the leg.⁷

Schwannomas are slowly progressive over the years and pain is seldom a prominent feature, though they may be tender. Sudden onset of bleeding in the tumor may cause pain and neurological deficits. In areas where a schwannoma arises from a peripheral nerve, such as deep peroneal nerve under a firm fascia of the anterior compartment of the leg, there is a higher likelihood of pain and motor deficits despite the tumor being smaller, as happened in our case. Smaller tumors are occasionally found when operating for peroneal nerve entrapment syndrome,^{5,6,8} but despite an extensive literature search, we could not find a case similar to the one presented in this report.

Plain radiography, isotope scanning, CT and ultrasound scanning, or MRI are performed to rule out bony involvement, to delineate the extent of the lesion, to detect the presence of other lesions in the body, and to evaluate the biological nature and differential diagnosis, especially when a malignant growth is suspected. Occasionally, a lateral disc herniation at L₄-L₅ can mimic peroneal entrapment neuropathy.⁴ Electromyograph (EMG) study will show a paraspinal denervation in this type of radicular involvement but our case was not subjected to this study. In addition, L₅ involvement may weaken inversion of the foot and give L₅ dermatomal sensory change, rather than a peroneal nerve distribution of sensory loss.

Schwannomas can be completely excised without major loss of function and without recurrence. Magnification and microsurgical instrumentation are helpful in dissecting the tumor and preserving the nerve of origin. The peroneal nerves appear to be straightforward structures, but care must be taken in the clinical management, including during microsurgery, to obtain qualitative results.

An occult or a small schwannoma of the deep peroneal nerve may present with neuralgia mimicking sciatica due to a L₄-L₅ lumbar disc prolapse. In locations where even a small schwannoma arises from a peripheral nerve, such as the deep peroneal nerve under a firm fascia, there is greater likelihood of neuralgic pains and motor deficits. Attention to the details of clinical examination may reveal a focal tender spot or a swelling in the anterior compartment of the leg, and may save the patient from unnecessary exploratory microdissection. Microsurgical techniques for excision of deep peroneal nerve schwannoma are curative.

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