

## Tarsal Tunnel Syndrome Secondary to Schwannoma of the Posterior Tibial Nerve

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### ABSTRACT

Schwannoma is a benign tumor that arises from the peripheral nerve sheath. It presents as a discrete, often tender, and palpable nodule associated with neurogenic pain or paresthesia when compressed or traumatized. The growth rate is usually slow, and these lesions seldom exceed 2 cm in diameter. We report the case of a large schwannoma arising from the posterior tibial nerve located in the posterior medial ankle. The core needle biopsy findings were suggestive of a schwannoma, with spindle cells strongly and uniformly immunostaining for S-100 protein. The mass was marginally excised. The surgical specimen consisted of a grossly encapsulated white-yellow mass with irregular contours, measuring  $3.7 \times 3.5 \times 2.7$  cm. The cut surface showed areas of pin-point hemorrhage. The patient did not encounter any motor deficits; however, early results showed some subjective numbness. Few reports have been published of schwannomas arising from the tibial nerve. Marginal excision appears to be the recommended therapy for this tumor, without any evidence of recurrence at 9 months of follow-up.

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A schwannoma is a benign tumor that arises from the peripheral nerve sheath. The tumor has been described by many names, including neurilemoma, neuroschwannoma, neurofibroma, perineuroma, peripheral glioma, and schwannoma (1,2). They are usually found on the trunk, head, neck, and upper extremities and are less frequently seen in the lower extremities (3). White (1) and Spiegel et al (2) reported 4 of 45 and 11 of 100 neurilemmomas in the foot, respectively.

Schwannomas typically occur between the ages of 20 and 50 years old, with no gender predilection (4–6). They are often associated with the eighth cranial nerve but can also be found throughout the body (4). The tumors have a predilection for the head, neck, and flexor surfaces of the upper and lower extremities. Consequently, the spinal roots and the cervical, sympathetic, vagus, peroneal, and ulnar nerves are most commonly affected (5). Neurilemoma has been uncommonly found involving the posterior tibial nerve (7,8).

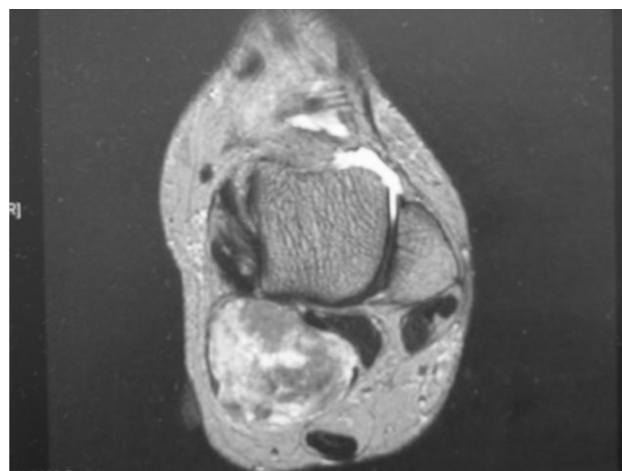
We report the case of a large schwannoma arising from the posterior tibial nerve located in the posterior medial ankle.

### Case Report

A 54-year-old female presented to the Beth Israel Deaconess Medical Center with a mass on the medial aspect of her left ankle of

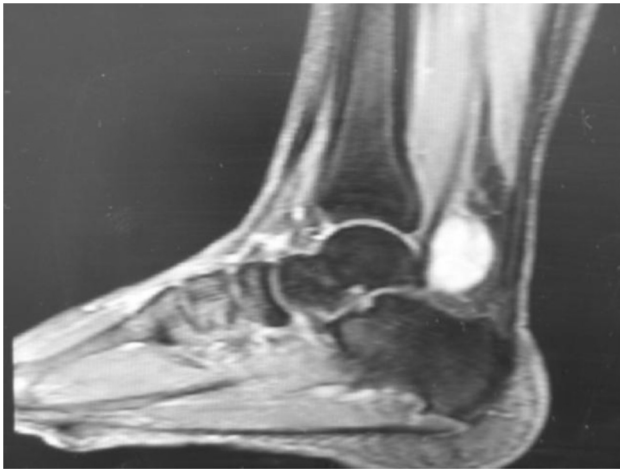
10 years duration. The mass was firm and palpable, with pain to direct palpation and a positive Villeux sign on clinical observation. No skin lesions, fluctuance, or clinical signs of infection were noted.

Magnetic resonance imaging of the left ankle revealed a  $3.4 \times 3.0 \times 3.0$ -cm T<sub>1</sub>-weighted hyperintense heterogeneous mass located



**Fig. 1.** Coronal T<sub>1</sub>-weighted magnetic resonance imaging scan revealing  $3.4 \times 3.0 \times 3.0$ -cm hyperintense heterogeneous mass on medial aspect of ankle joint.

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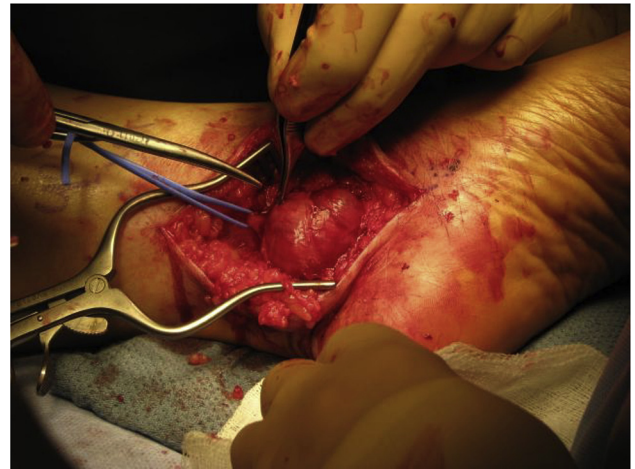


**Fig. 2.** Sagittal T<sub>1</sub>-weighted magnetic resonance imaging scan revealing 3.4 × 3.0 × 3.0-cm hyperintense heterogeneous mass on medial aspect of ankle joint.

on the medial aspect of the ankle joint (Figs. 1 and 2). The lesion was intimately associated with the posterior tibial neurovascular bundle. The lesion appeared to splay the posterior tibial nerve medially and superficially and the posterior tibial vessels deeply and laterally. The lesion appeared to abut both the flexor hallucis longus and flexor digitorum longus and was exerting a mass effect. These findings were not typical of a peripheral nerve sheath tumor; therefore, the differential diagnosis included benign and malignant etiologies, including sarcoma, synovial sarcoma, and, less likely, giant cell tumor.

Because of the unusual presentation on magnetic resonance imaging, a fine needle biopsy of the lesion was performed under ultrasound guidance. The pathologic findings were suggestive of a schwannoma, with spindle cells strongly and uniformly positive for S-100 protein. Cytology was negative for any malignant cells.

Owing to the size of the mass and the significant pain symptoms, the patient elected to pursue surgical excision. The patient was brought into the operating room, placed in the supine position, and general anesthesia was administered. A midcalf tourniquet was applied but was not used during the case. Attention was directed to the medial aspect of the left ankle, where the course of the posterior tibial artery was traced and marked with a hand-held Doppler probe. An incision was then made just lateral to the posterior tibial artery. This measured approximately 12 cm in length with a “hockey-stick”



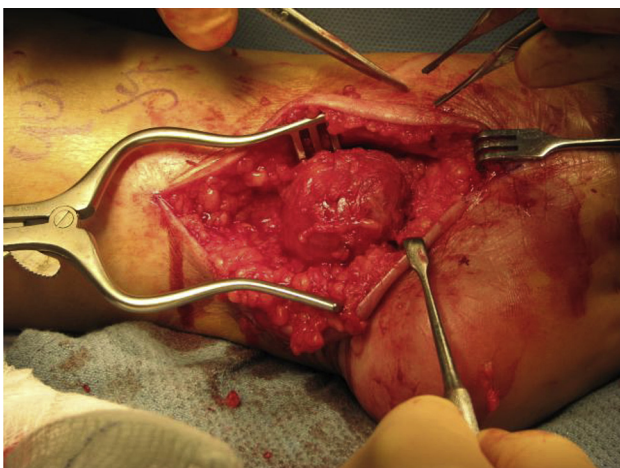
**Fig. 4.** Intraoperative image with vascular loops tagging the proximal aspect of the posterior tibial nerve.

extension into the porta pedis of the left foot. This incision was deepened by sharp and blunt dissection through the deep fascial layers, taking care to avoid the neurovascular structures. The soft tissues were then released within the tarsal tunnel. Immediately, a large, firm mass was noted (Fig. 3). This was ovoid, with a slightly loculated consistency, and heterogeneous in color, alternating between pearly white and yellow, with some dark purplish staining.

The soft tissue mass was then dissected under loupe magnification. The longitudinal vasa nervorum of the posterior tibial nerve was identified both medially and laterally on the surface of the mass. The mass was then dissected superiorly and proximally with fine-tipped instrumentation. The posterior tibial nerve was now identified, extending from the proximal aspect of the mass. Using vascular loops, this was gently tagged and retracted out of the way (Fig. 4).

Dissection was then carried distally, where the distal continuation of the posterior tibial nerve was also identified. It was likewise tagged with vascular loops and retracted out of the way. Next, the nerve sheath was incised with a no. 15 blade. The mass was then dissected free from the nerve sheath and passed from the operative field for submission to the pathology department (Figs. 5 and 6). The adjacent nerve fascicles were identified and left intact.

The excised mass measured 3.2 cm by 3.0 cm in diameter. It was ovoid in appearance. The wound was irrigated with copious amounts of



**Fig. 3.** Intraoperative soft tissue mass located on medial ankle of the left foot.



**Fig. 5.** Intraoperative specimen of soft tissue mass from medial aspect of left ankle.

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