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Dr. P Ashok
Associate Professor, University of Health Sciences, Vijayawada, Andhra Pradesh, India

Dr. Siddaram Patil N
Professor & HOD, ANH, NRI Institute of Medical Sciences, Sangivalasa, Visakhapatnam, Andhra Pradesh, India

Dr. M Sai Phanindra
Assistant Professor, University of Health Sciences, Vijayawada, Andhra Pradesh, India

Dr. P Hima Bindu
Senior Resident, University of Health Sciences, Vijayawada, Andhra Prades, India

Dr. T Prithvi Raj
Junior Resident, University of Health Sciences, Vijayawada, Andhra Pradesh, India

Dr. D Tej Narayana
Junior Resident, University of Health Sciences, Vijayawada, Andhra Pradesh, India

Corresponding Author:
Dr. Siddaram Patil N
Professor & HOD, ANH, NRI Institute of Medical Sciences, Sangivalasa, Visakhapatnam, Andhra Pradesh, India

Posterior tibial nerve, schwannoma at medial aspect of ankle joint: A case report

Dr. P Ashok, Dr. Siddaram Patil N, Dr. M Sai Phanindra, Dr. P Hima Bindu, Dr. T Prithvi Raj and Dr. D Tej Narayana

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Abstract
Schwannomas are rare, benign tumors originating in the Schwann cells of the peripheral nervous system. They are most commonly found in the head, neck, and upper extremities, which involve the spinal nerves of the brachial plexus. However, schwannomas of the lower extremities are extremely uncommon, and few studies have reported a schwannoma originating from the posterior tibial nerve. We report on a case of a 48 -year old female who presented to our hospital because of left foot and ankle neuritic pain. A nerve tumor was found; subsequently, the tumor was surgically excised along with the release of the tarsal tunnel.

Keywords: Schwannoma, tarsal, posterior tibial nerve, benign tumour

Introduction
A schwannoma is a benign nerve sheath tumor arising from the Schwann cells of the peripheral nervous system. They tend to be isolated, slow-growing, and well-encapsulated neoplasms that form within the perineurium [1-5]. An exception to this is when they are associated with neurofibromatosis. Although some reports have suggested an association with prior trauma [3, 4], schwannomas commonly present in the fourth decade of life with no gender bias reported in the literature and an infrequent rate of malignant transformation [1, 2, 4-6]. Schwannomas most commonly occur in the head and neck region involving the spinal nerves and the brachial plexus. They are a rare occurrence in the lower extremities, particularly in the foot and ankle, with the most common nerve affected being the posterior tibial nerve [2-5, 7-9]. Solitary schwannomas can present as an asymptomatic lump or cause compressive neuropathy due to a mass effect and displacement of nerve bundles. A typical presentation is pain and numbness of the plantar foot which can be mistaken to be due to lumbar radiculopathy. Diagnosis can be missed or delayed due to the slow growth of these tumors, leading to the development of tarsal tunnel syndrome because of compression of the posterior tibial nerve [4, 7-13]. Schwannomas can be carefully resected without damage to the adjacent nerve due to their nerve sheath origin [2, 5]. We report a case of a patient with a lower extremity schwannoma affecting the posterior tibial nerve, behind medial sie of ankle joint and fore foot.

Case Presentation
A 48-year-old female with no significant past medical history presented to our clinic with left foot and ankle pain for six years. Her pain had been increasing progressively in intensity as well as frequency. She described the pain as electric and burning in nature, located in the medial side of left ankle, she failed to respond, and MRI was performed which revealed a nerve tumor.
A review of systems was negative. Examination of her left leg, foot and ankle indicated that she was non- tender to palpation in the ankle calf along the posteromedial and supramalleolar regions. All other neurovascular signs were normal.
The MRI of the left ankle showed a mass resembling “egg on a string” that appeared to be a peripheral nerve sheath tumor. This mass showed enhancement on T2 and postcontrast. It seemed well-encapsulated without significant edema surrounding it, had good ankle and

subtalar range of motion with an intact sensation along posterior tibial nerve.
At her last follow up two years from the surgery, she did not have pain in the foot and/or ankle regions.

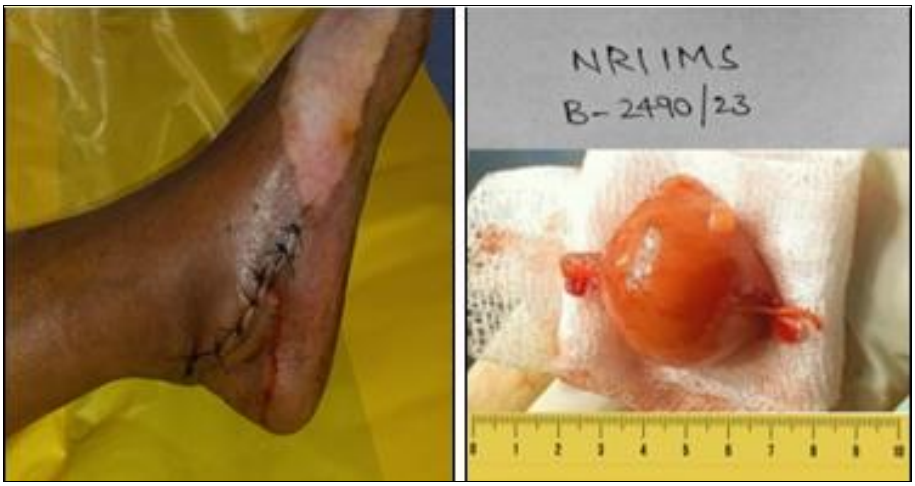

Fig 1: Post-Operative & Specimen of Swelling separated from nerve sheeth

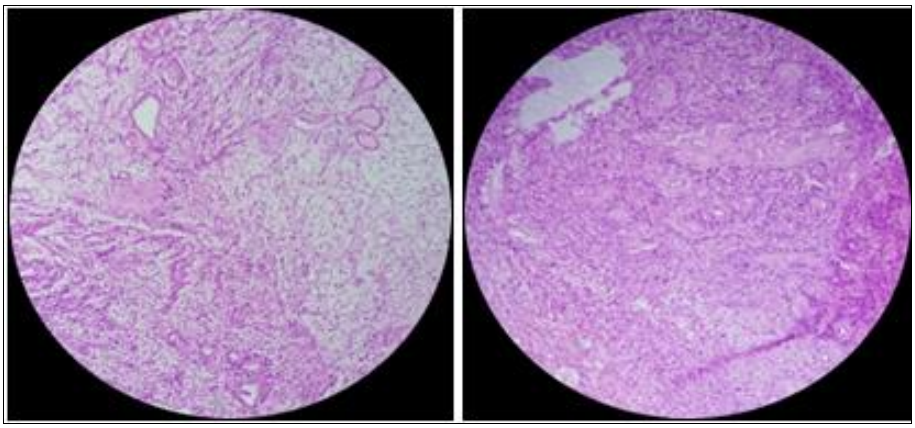

Fig 2: Histopathology Microscopic picture of Ortho Specimen showing perineurium

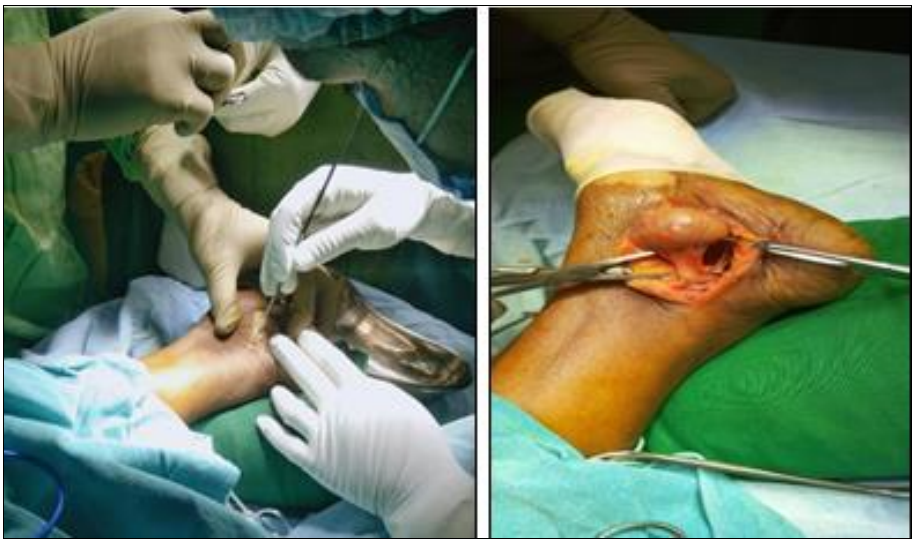

Fig 3: Intra Operative photos of swelling, anatomically arising from nerve sheeth

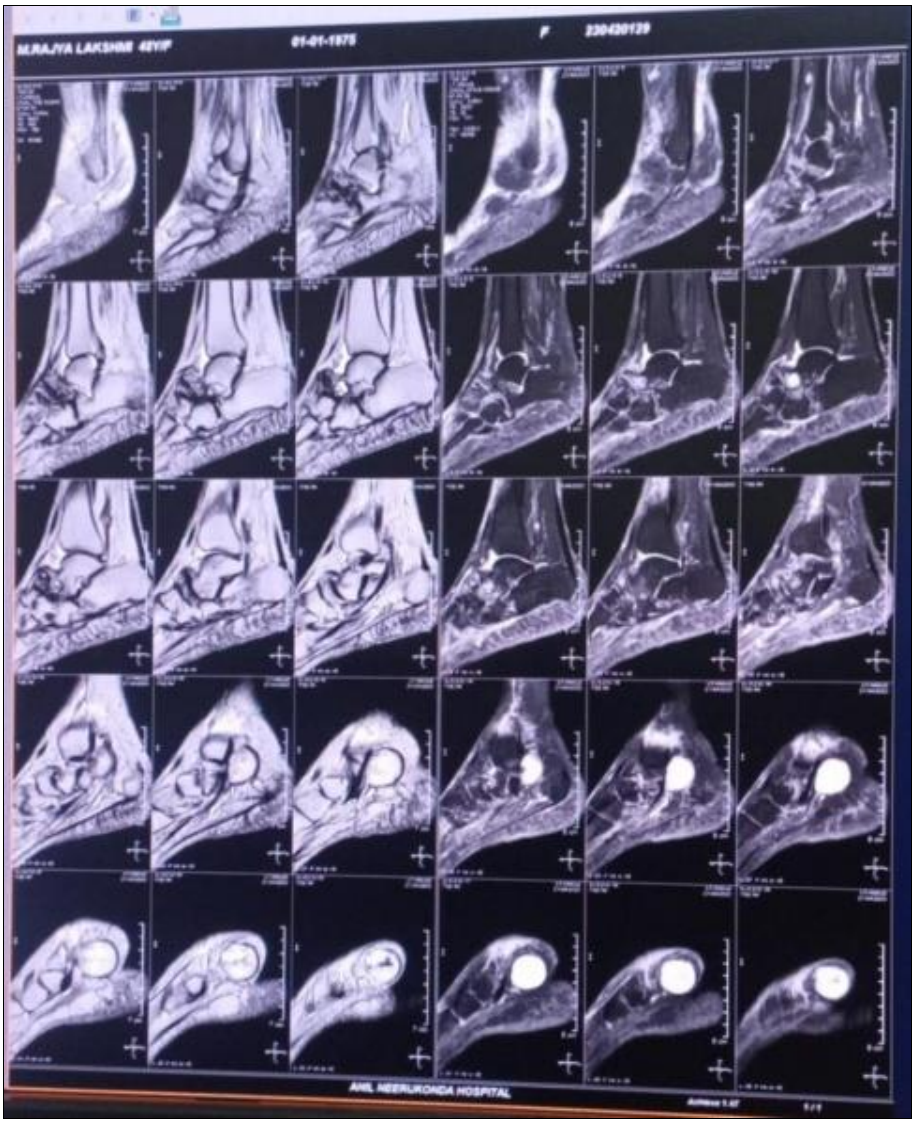

Fig 4: MRI Scan of T1 & T2 image

Discussion

Schwannomas are slow growing peripheral nerve tumors arising from Schwann cells of the nerve sheath [1-13]. Though schwannoma is the most common tumor of the peripheral nerve sheath, it's rate of occurrence in the lower extremities is extremely low. The lower extremities are affected in less than 10% of all cases [1-13]. The vast majority of schwannomas are benign.

However, malignant schwannomas account for 5% of peripheral nerve sheath tumors [4]. Very few studies present a schwannoma affecting the posterior tibial nerve. Schwannomas typically appear as a slow growing palpable soft-tissue masses with symptoms similar to that of compressive neuropathy. These masses grow abnormally causing compression and improper displacement of critical nerve fascicles. Patients often present with a myriad of conditions in response to the presence of schwannomas. Clinical symptoms include pain, discomfort, swelling, weakness, and paresthesia [4]. To diagnose a schwannoma, a thorough examination of the patient's clinical history and physical examination must be performed. Positive Tinel signs and dorsiflexion-eversion are two tests that may suggest the presence of a schwannoma of the posterior tibial nerve [6, 8, 11]. Addtionally, nerve conduction studies may indicate a schwannoma's existence. Radiographs are used to eliminate bone abnormalities [4]. Ultrasonography typically display a solid, sharply delineated, oval mass [4, 11]. MRI may be used to define the characteristics of the tumor. The mass appears isointense compared to skeletal muscles on T1-weighted plates and eccentric relative to the involved nerve that is displaced [4]. The tumor is hyperintense on T2-weighted images. Gadolinium may be used in conjunction with MRI to improve image contrast, allowing better assessment of the lesion [4].

Diagnosing a schwannoma may often be difficult due to several reasons. First, schwannomas are uncommon in the lower extremities. Furthermore, they may be ingrained in the soft-tissue, rendering the tumor impalpable. Lastly, lumbar radiculopathy is a common misdiagnosis of neuropathic pain around the foot in the absence of a solid mass, pathology, and imaging [3, 7, 11]. Nawabi and Sinsi reported the mean time to diagnose a schwannoma to be 86.5 months in 25 cases [7]. In the study, only 3 of 25 patients were diagnosed within a year, the longest documented delay was 30 years.

All the patients in the study complained of pain with 18patients specifically complaining of pain in the sole of the foot, and the remaining seven patients complaining of pain in the calf and the ankle. Tinel's sign was reported to be present in all the cases. The study concluded that after excluding lumbar and pelvic lesions in patients with a long-standing history of neuropathic pain in the lower limb, a benign tumor of the peripheral nerve may be sought to explain the

symptoms. Surgical excision and decompression of the affected nerve is the most commonly employed method in treating and managing schwannomas. A longitudinal excision over the perineurium of the middle of the tumor is considered to minimize invasiveness [4, 6]. The key to preventing further neurological complications is preserving the nerve fascicle during excision [6, 13].

Complete excision is recommended since incomplete resection may result in recurrence with the current reported recurrence rate being less than 5% [6, 13]. Following excision, histopathological assessment can be used to further confirm the diagnosis of a schwannoma.

The biphasic presence of Antoni type A and Antoni type B cells comprise schwannomas and indicate its presence in histopathological analysis. Antoni type A tissue are dense and orderly arranged; in contrast, Antoni B tissue have fewer cells and disorganized areas [4, 8]. The patient in this case report was diagnosed with and treated for peripheral neuropathy for 3 years without any symptoms before an MRI was performed that revealed the posterior tibial nerve mass. Surgical removal and histopathological examination of this mass confirmed it to be a Schwannoma. Surgery also resolved the patient's symptoms.

Conclusions

In conclusion, while rare, lower extremity schwannomas can pose a problem for patients due to their discomfort and the delay in diagnosis. Delay in diagnosis of these slow growing neoplasms can lead to further complications such as, due to compression of nearby structures such as the posterior tibial nerve. It is important to recognize these tumors early in their presentation to avoid further complications and alleviate the symptoms the patients are experiencing. A high clinical suspicion along with appropriate imaging can lead to early detection and removal of these tumors.

Conflict of Interest

Not available

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Not available

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