



## Giant conventional schwannoma of the foot: A case report

by Low Chin Aun, MBBS; Agus Iwan Foad, MS Orth

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Schwannomas, also known as neurilemmoma, are amongst the most common tumors arising from peripheral nerves. It usually presents as a solitary swelling and may occur anywhere in the body with a neural supply. However, its occurrence in the foot is rarely reported. We report a case of a sixty year old man with a large schwannoma of his right foot, who never sought treatment for 20 years since its first occurrence.

**Key words:** Schwannoma, neurilemmoma, tumor, foot

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Schwannoma is the most common benign, neurogenic tumor arising from Schwann cells of nerve sheaths. It occurs most frequently in the head and neck region, especially involving cranial nerves and brachial plexus. It is seldom reported in the upper and lower limbs [1]. This tumor grows in variable size and usually present as a slow growing solitary tumor, rarely associated with pain and paraesthesia. Neurological symptoms often accompany larger swelling. Its occurrence in the foot is rarely reported. Schwannomas constituted 5% of all benign soft-tissue tumors, and only 9% of these schwannomas were found in the foot or ankle [2]. We report a case of a large cutaneous schwannoma of the foot and its management.

### Case Report

A 60-year-old man presented to our orthopaedic outpatient clinic with complaints of a solitary swelling over the lateral aspect of his right forefoot. He claimed the swelling has been gradually increasing in size for the past twenty years and was associated with intermittent pain and paraesthesia at his right foot. The swelling prohibited him from wearing his footwear due to its size. Patient has tried traditional treatment with massage and ointments but had no improvement. His past medical history was unremarkable and there was no family history suggestive of neurofibromatosis.

Physical examination revealed a 10cm x 10cm x 8cm tumor over the lateral aspect of his right foot (Figure 1). Its consistency was firm, and it was attached to the underlying tissue. On percussion, it produces an electric shock similar to Tinel's sign. However, there was no tenderness, erythematous, warmth or ulceration of the skin over the tumor. Neurovascular status of the right foot was normal. Systemic review was unremarkable. Plain radiograph of the right foot did not show any bony involvement (Figure 2).

**Address correspondence to:** Low Chin Aun  
Department of Orthopaedic Surgery, Hospital Tuanku Ampuan Najihah,  
Kuala Pilah, Malaysia.  
[robinlca@gmail.com](mailto:robinlca@gmail.com)

1 Department of Orthopaedic Surgery, Hospital Tuanku Ampuan Najihah,  
Kuala Pilah, Malaysia



**Figure 1** Swelling on the lateral aspect of patient's foot.



**Figure 2** X-rays revealing a tumor on the lateral aspect of patient's right foot.

At surgical excision, the capsule was found at the deeper plane. There was no attachment of the tumor with adjacent soft tissue which permitted easy in toto removal. The wound was then closed with split skin graft harvested from his left thigh. The patient did not experience any complication postoperatively. The tumor was preserved in formalin solution and sent to the pathology lab. One month later he was reviewed again in the clinic. There were no evidence of recurrence and his wound had healed well with good uptake of the skin graft (Figure 3). Histopathological examination revealed a conventional right foot schwannoma with cystic degeneration.



**Figure 3** Well healed wound post-removal of schwannoma.

### Discussion

Schwannoma of the foot is interesting due to its rarity. Its diagnosis and treatment should be differentiated with neurofibroma or malignant peripheral nerve sheath tumor (MPNST). Schwannoma is embryologically derived from neuroectodermal Schwann cell which forms the myelin sheath that facilitates transmission of nerve impulses [3]. This well encapsulated tumor is usually benign in nature and malignant transformation is rarely reported [4]. Multiple schwannomas have been reported to have autosomal dominant inheritance. These tumors have also been associated with von Recklinghausen's disease in which there is somatic mutation of NF2 gene. It appears that it has no geographical and race predilection. The average age of its presentation is 20 – 50 years with a mean age of 46 [2].

Benign peripheral nerve sheath tumors are divided into two major groups; Schwannoma and neurofibroma. Differentiation of schwannoma from neurofibroma is of importance because schwannoma can easily be shelled out without injuring the nerve contiguity. In neurofibroma, the nerve is incorporated into the mass. Surgery of neurofibroma might need to resect the nerve, and subsequent nerve grafting might

be needed to restore function. Large schwannoma commonly undergo cystic degeneration. Few neurofibromas have cystic changes due to myxoid degeneration. There has been argument about the cystic degeneration between the two tumors. Most literature showed schwannoma has higher chance of cystic degeneration compared to neurofibroma. Histogenesis of schwannoma and neurofibroma has been argued for decades and is beyond the scope of the discussion. It suffices to say that solitary schwannoma is composed almost exclusively of cells with characteristics of differentiated Schwann cells. However neurofibroma shows the presence of three types of cells, i.e. Schwann-like cells, perineurial-like cells, and fibroblast-like cells. Histologically staining with S-100 shows that schwannoma has hypercellular area alternating with hypocellular area, which respectively are called Antoni A, and Antoni B areas. The hypercellular area is made up of spindle cells with tapered nuclei arranged in palisading pattern whereas the hypocellular area is composed of loose stroma [4].

Malignant peripheral nerve sheath tumor (MPNST) is a sarcoma which can originate from peripheral nerve or from the cell associated with the nerve sheath, such as Schwann cell, perineurial cell, or fibroblast [5]. The term MPNST replaces previously used names including malignant schwannoma, neurofibrosarcoma and neurogenic sarcoma. Fifty percent of MPNST occurs in patient with NF1 gene. It typically occurs between the ages of 20 – 50. The clinical presentation is almost the same as schwannoma and neurofibroma except the rapidly enlarging mass within the time spectrum alerts the physician of the possibility of its malignant degeneration. Histological appearance shows dense cellular fascicles alternating with myxoid region. This swirling arrangement is also called

marbleized pattern. The cells may be spindle, round or fusiform in shape. Nuclear palisading is very rare compare with schwannoma and occurs in only 10% of cases. Malignancy is suggested by invasion of the surrounding tissue, and vascular structures, nuclear pleomorphism, necrosis, and mitotic activity.

## Conclusion

Schwannoma of the foot is a rare tumor which present as solitary swelling of the extremity. Clinicians should always consider schwannoma as a differential diagnosis during approach of mass in the upper or lower limbs. It is essential to differentiate schwannoma with neurofibroma, and also MPNST as each entity is differently managed clinically.

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