www.jmscr.igmpublication.org Impact Factor 3.79
ISSN (e)-2347-176x

IGM Publication Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Schwannoma of Medial Sural Cutaneous Nerve - A Rare Entity in Orthopedics

Authors
Dr. Sonik Bharat Shah, Dr. Prakash D Samant, Dr. Atul Kharat
Dr D.Y. Patil Hospital, Sector-5, Nerul East, Navi Mumbai, Maharahtra, India 400706
Email: *shah.sonik@gmail.com, prakashsamant@gmail.com, dratulkharat@gmail.com*
Corresponding Author
Dr. Sonik Bharat Shah
B Wing, Flat no. 5,6, Amivarsha Apartment, Opposite Syndicate Bank, S.V.Road, Kandivali West, Mumbai, Maharashtra, India 400067.
Email: *shah.sonik@gmail.com*

Abstract

A Schwannoma is a well encapsulated, non-infiltrating, benign nerve sheath tumour arising from Schwann cells of Neuroectoderm. Schwannoma of a peripheral nerve is a rare entity and should be kept in mind as a differential diagnosis for any musculoskeletal pain.

Keywords: *Schwannoma, medial Sural cutaneous nerve, neuroectodermal tumors, Schwann cells tumor, solitary Schwannoma.*

INTRODUCTION

In 1908, Verocay first described a nerve tumour arising from myelin sheath as neurinoma[1].Later in 1935; Stout elaborated on studies of nerve sheath tumours and reported tumours of neuroectodermal origin[2]. Schwann cells and collagen fibres arise from the Neuroectoderm. A Schwannoma is a well encapsulated, non infiltrating, benign nerve sheath tumour arising from Schwann cells of Neuroectoderm.

Schwannoma are most common solitary nerve tumor of the body. Schwannoma can be commonly found as a slow growing mass in the head, neck and the flexors surfaces of upper and lower exterimities[3].The peak incidence occurs in second to sixth decade of life, with no gender predilection. Schwannoma in peripheral nerve accounts for 1%-3%. They rarely metastatize[4].

Medial cutaneous nerve is an exceptionally rare site for Schwannoma. In this study, we discuss a

case of Schwannoma of medial Sural cutaneous nerve in a middle age lady.

CASE REPORT

A 40 year lady presented with complains of radiating pain in the right leg since one year which was insidious in onset, dull aching, intermittent, associated later on with tingling numbness mimicking L_5-S_1 prolapsed intervertebral disc. Examinations of spine, knee and ankle was normal. Neurological assessment for spine was also normal. On local examination she had a 2-3 cm, firm swelling, mobile side to side, nontender, in the bulk of Gastronemius near the proximal one-third of Tibia, non fluctuating, with defined edges. Tinel`s sign was normal. Initially patient was treated symptomatically for radiculitis elsewhere for one year. On further evaluation, X-rays were normal; Arterial and Venous Doppler were normal. MRI suggested a well defined lobulated mass located between two heads off Gastronemius muscle along the course of medial Sural cutaneous nerve measuring 22mmx19mmx26mm.It appeared hypoitense on T1W images(Fig 1d) and hyperintense in T2W(Fig1e) images and moderate in homogenous enhancement (Fig 1a,b,c). After taking consent and anaesthesia fitness, surgery was performed under spinal anaesthesia with tourniquet control. The tumor and proximal and distal part of nerve was exposed (Fig 2b, c) and then a longitudinal incision was made in the epineurium . With help of blunt dissection (Fig 2a), epineurium was gently peeled out until shiny surface of tumor was exposed (Fig 2d). The entire tumor mass was excised in total without damage to the fascicles (Fig 2e). Grossly, the mass was tan white, smooth surfaced (Fig2e). Microscopic Histopathological studies showed proliferation of spindle shaped cells arranged in interlacing fascicles in Antoni A areas. Oedematous, hypocellular areas known as Antoni B (Fig 3a and Fig 3b). No mitosis or necrosis is seen. The tumor cells express S-100 protein (Fig 3c) and are immunonegative for SMA, Desmin and CD-34 (Fig3d).

The post operative course was uneventful and no neurological deficit. Till date patient has no recurrence.

RESULT

Schwannoma are rare solitary nerve sheath tumours and even rarer in peripheral nerves. They mostly are asymptomatic or present with mild symptoms and rarely severe in nature if presented late. Surgical excision of complete tumour mass remains the gold standard treatment. We present a rare case of medial Sural cutaneous nerve Schwannoma that was managed successfully with surgical excision with no post-operative complications.

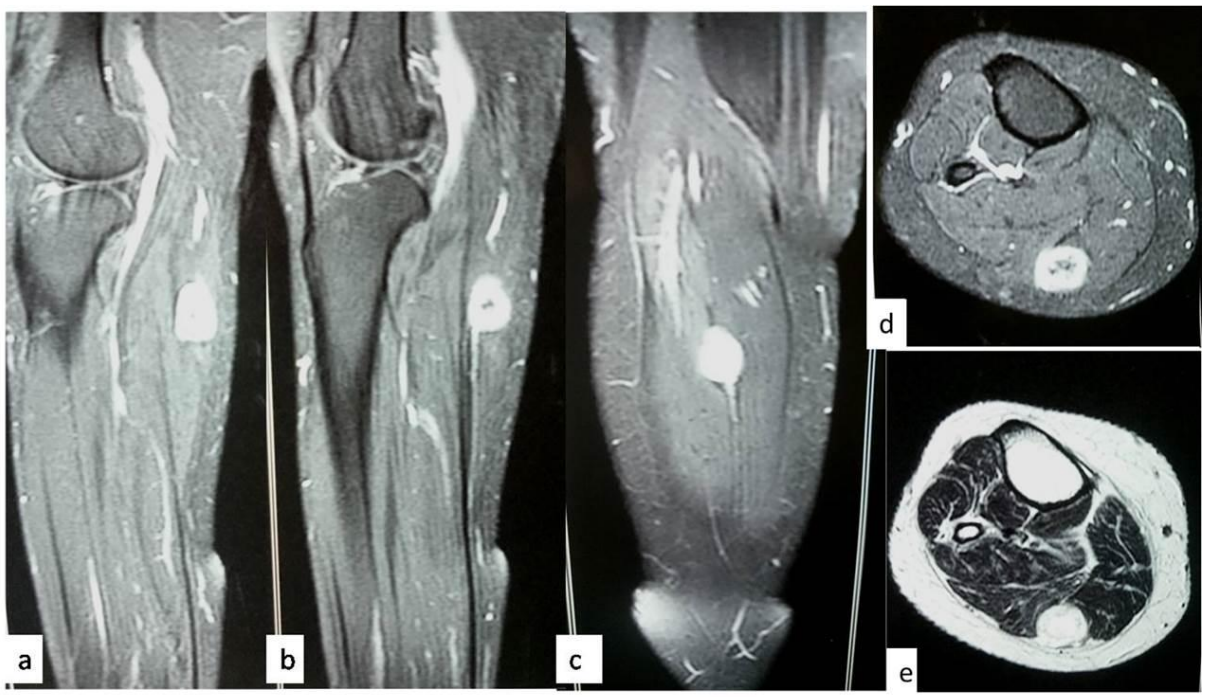

Figure 1 – a,b,c) On Sagittal MRI Schwannoma can be seen in relation to nerve and surrounding structures
d) On Axial Magnetic Resonance Imaging (MRI) the mass has hypointense signal on TIW images.
e) On Axial MRI hyperintense signal on T2W images.

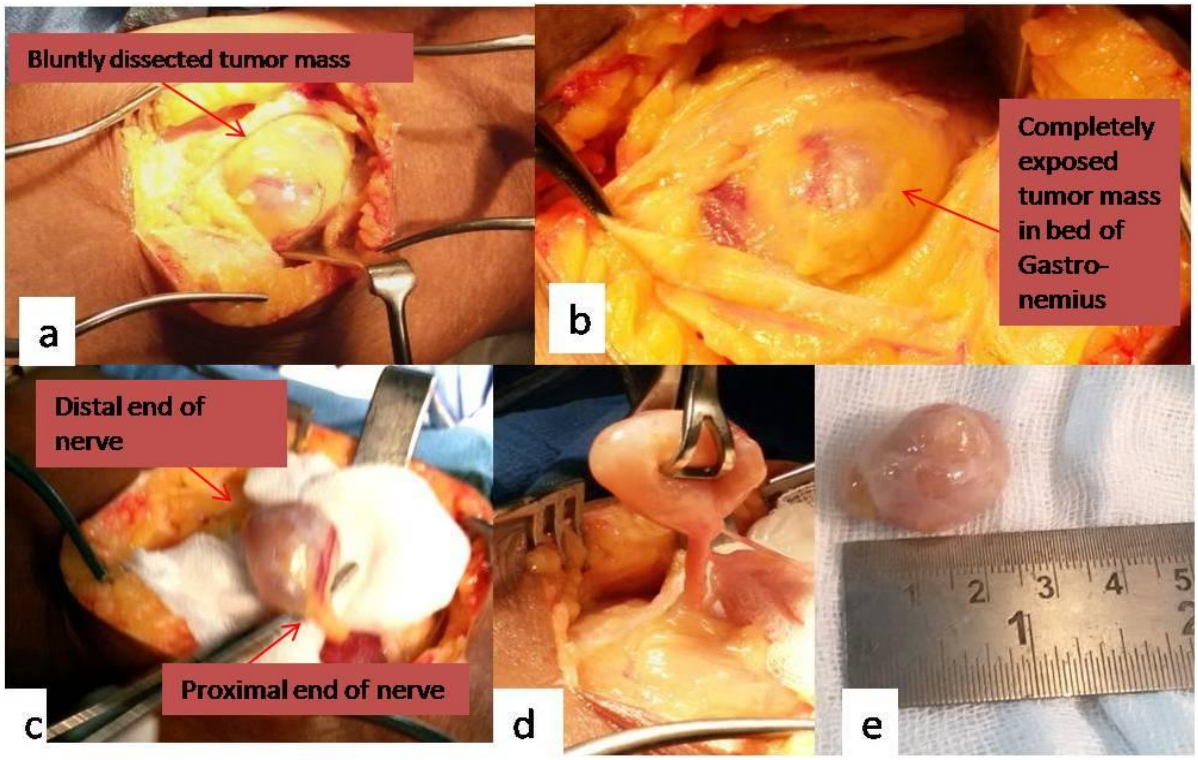

Figure 2 – a,b) Intraoperative photograph showing dissected tumour mass overlying medial Sural cutaneous nerve,
c) isolated nerve with tumor mass in middle with dissection of nerve`s proximal and distal end,
d) showing tumor mass been excised with blunt dissection,
e) gross appearance of excised tumor mass with measurement.

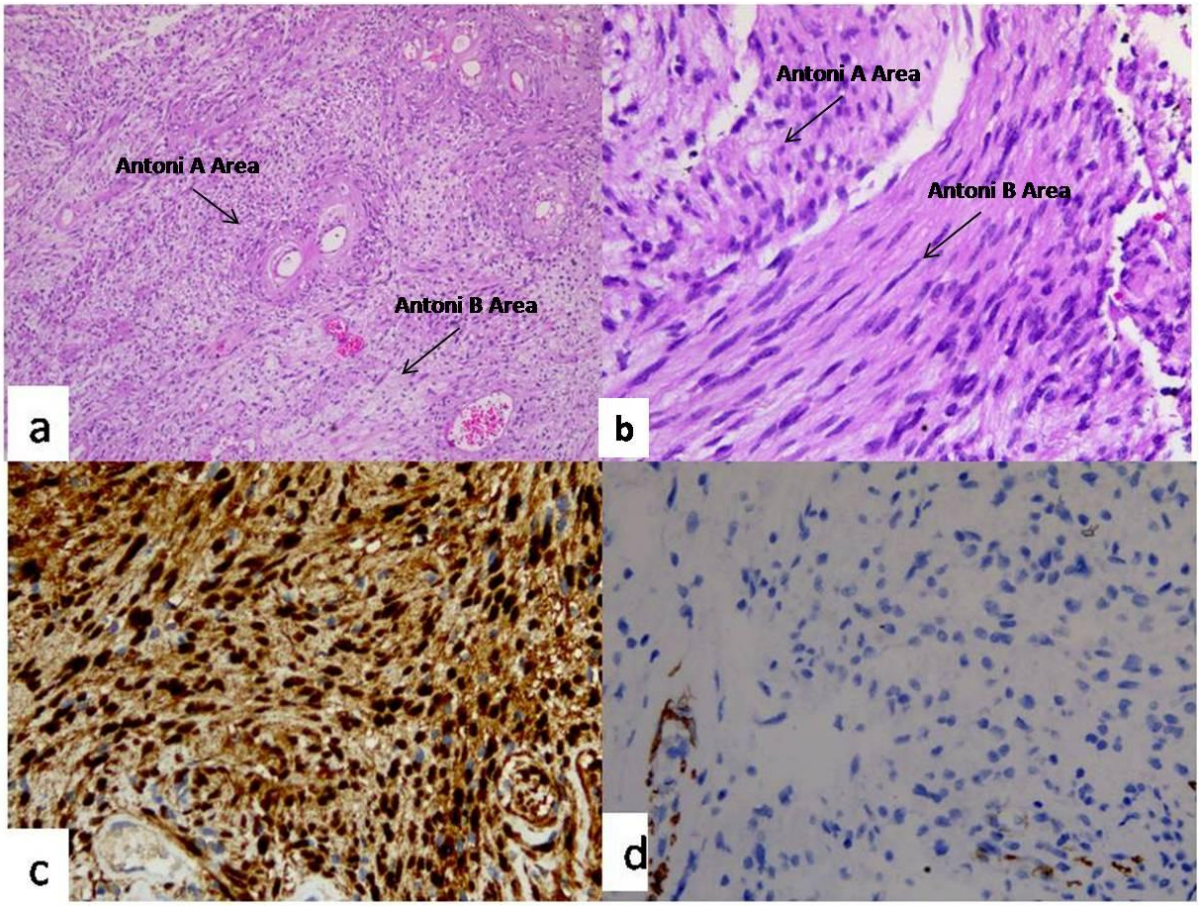

Figure 3-a,b) Photomicrographs showing hypercellular Antoni A areas and loose Antoni B Area (Hematoxylin and eosin staining, magnification 10x (a) and 40x(b).
c) Photomicrograph showing S100 protein Positive.
d) photomicrograph showing SMA immunonegative

DISCUSSION

The medial Sural cutaneous nerve originates from the tibial nerve, descends distally between the two head of Gastronemius and about the middle of the back of the leg, pierces the deep fascia and unites with the anastomotic ramus of common perineal nerve to form the Sural nerve[5].Solitary Schwannoma arising from this nerve is extremely rare and only few cases are reported in the English Literature.[6,7 ,8,]

Schwann cells are the myelin secreting cells surrounding a myelinated nerve fiber between two nodes of Ranvier. Myelin helps in insulation of nerve and facilitates transmission of impulses. Schwannoma are derived from Schwann cells.

Schwannoma are well circumscribed, spherical or elliptical in shape, grows extra fascicular leading to displacement of nerve, located beyond oligodendoglial-Schwann cell junctions. Schwannoma are closely related to neurofibroma. Unlike neurofibroma Schwannoma do not transverse through the nerve but remain on the top of the nerve. Schwannoma are reported with autosomal dominant tansmission[9]. Commonly

seen between second to sixth decade of life with no gender predilection[10].

Liebau, presented first case of solitary neurilemma and he quoted that Schwannoma should be looked for in all cases where patients presents with pain, paresthesia of leg and foot, especially if all other injuries have been ruled out[11]. Studies relate a co relation between size of the nerve trunk and size of the lesion[12]. Schwannoma are predominantly seen in nerves of flexors surface as the nerves trunks are larger and thicker[2, 13].

Nerve sheath tumors are diagnosed on Magnetic resonance imaging (MRI) as hypointense T1W image and T2W image. Gadolinium enhancement scan are most sensitive.

Schwannoma is microscopically composed of higher cellular areas, Antoni type A and higher Myxoid areas, Antoni type B. Degenerative changes in form of cyst, calcification, haemorrhage, hyalinization may be present. No intratumoral axons are present. Immunologically Schwannoma are reactive to S100>Leu-7, Epithelial membrane antigen.

The gold standard for treatment is meticulous surgical excision of tumor mass. Ogose et al reported a case of multiple schwannoma in sural nerve[12].Yamamoto[14] et al and Mendeszoon[15]et al reported a case of solitary schwannoma of sural nerve They operated using complete excision of tumour mass with en bloc resection, post-op complication of incomplete peroneal nerve palsy was reported.

ACKNOWLEDGEMENTS

No authors received anything of value in relation to this work.

REFERENCES

1. Verocay J: Zur Kenntnis der Neurofibroma Beitr Pathol Anat 48:1 – 69, 1910.
2. Stout AP: The peripheral manifestations of the specific nerve sheath tumor (Neurilemoma) Am J Cancer 24: 751 – 796, 1935.
3. Antonescu CR, Perry A and Woodruff JM: Schwannoma (including variants). In: World Health Organization Classification of Tumours of Soft Tissue and Bone. Fletcher CDM, Bridge JA, Hogendoorn PCW and Mertens F (eds). 4th edition. IARC Press, Lyon, pp170-172, 2013.
4. Giannestras NJ, Bronson JL: Malignant schwannoma of the medial plantar branch of the posterior tibial nerve (unassociated with von Recklinghausen's disease) A Case Report. J Bone Joint Surg 57A (5): 701 – 703, 1975.
5. Gray`s Anatomy: The Anatomical basis of clinical practice 5:1427,2013,40edition.
6. Isobe K, Shimizu T, Akahane T and Kato H: Imaging of ancient schwannoma. AJR Am J Roentgenol 183: 331-336, 2004.
7. Kim DH, Murovic JA, Tiel RL, Moes G and Kline DG: A series of 397 peripheral neural sheath tumors: 30-year experience at Louisiana State University Health Sciences Center. J Neurosurg 102: 246-255, 2005.

8. Fellegara G and Bisceglia M: Intraneural schwannoma. Int J Surg Pathol 16: 57-58, 2008.
9. Liebau C, Baltzer AW, Schneppenheim M, Braunstein S,·Koch H, Merk H: Isolated peripheral neurilemoma attached to the tendon of the flexor digitorum longus muscle. Arch Orthop Trauma Surg 123: 98 – 101, 2003.
10. Joyce M, Laing AJ, Mullet H, Mofidi A, Tansey D, Connolly CE, McCabe, JP: Multiple schwannomas of the posterior tibial. Nerve Foot Ankle Surgery 8:101 – 103, 2002.
11. White NB: Neurilemomas of the extremities J Bone Joint Surg 49A: 1605 – 1610, 1967.
12. Ogose A, Hotta T, Morita T, Yamamura S, Hosaka N, Kobayashi H, Hirata Y: Tumors of peripheral nerves: correlation of symptoms, clinical signs, imaging features, and histologic diagnosis. Skeletal Radiol 28(4):183-8, 1999.
13. Gominak S , Ochoa J: Sciatic schwannoma of the thigh causing foot pain mimicking plantar neuropathy. Muscle and Nerve 21 (4): 528 – 530, 1998.
14. Kosuke Yamamoto, Jun Nishio, Shintaro Yano And Masatoshi Naito :Solitary schwannoma of the sural nerve: An unusual clinical presentation, EXPERIMENTAL AND THERAPEUTIC MEDICINE 7: 90-92, 2014.
15. Mark J. Mendeszoon, Natalie Cunningham,Robert S Crockett, Donald Kushner:Schwannoma: A case report.The Foot and Ankle Online Journal 2 (10): 4