

Schwannoma of the Median Nerve at Mid Forearm Level

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What to Learn from this Article?

Though peripheral nerve schwannoma is rare and observation of a single patient can add to our understanding of etiology, pathogenesis, natural history and treatment of particularly that rare disease.

Abstract

Introduction: Schwannomas are also known as neurilemmoma that usually originate from Schwann cells located in the peripheral nerve sheaths. It usually occurs in the age group of 20 to 70 years. These are the commonest tumors of the peripheral nerves, 5% of which occur in the adults and 19% of the tumors occur in upper extremities. Schwannomas are generally presented as an asymptomatic mass. Discomfort may be the only presenting complaint of the patient. Paresthesia may be elicited on tapping the swelling. Magnetic resonance imaging, and ultrasound are helpful in the diagnosis. Surgical removal is usually curative.

Case Presentation: A 28-year-old male came to our hospital for a lump located at the volar side of the right mid forearm for 10 years with discomfort and paresthesia in median nerve distribution of hand which appeared in last two years. Total excision was performed for the lesion. Histopathological examination of the mass revealed typical features of schwannoma. At two months follow-up, the patient was symptom free with mild paresthesia in his index and middle fingers.

Conclusion: Benign tumours involving peripheral nerves of the upper extremity are uncommon. Schwannomas are theoretically removable because they repulse fascicular groups without penetrating them, thus allowing their enucleation while preserving nerve continuity, as reported in our patient.

Keywords: Schwannoma, Median nerve

Introduction

Benign tumors involving peripheral nerves of the upper extremity are uncommon[1]. The swelling may be misdiagnosed as ganglion, lipoma or lymph node. Schwannomas also known as neurilemmoma usually originate from Schwann cells located in the peripheral nerve sheaths. It usually occurs in the age group of 20 to 70 years. They are the commonest tumor of the peripheral nerves, 5% of which occur in the adults[2], and 19% of the tumours occur in upper extremities[3]. Schwannomas are generally presented as an asymptomatic mass. Discomfort may be the only complaint of the patient; however pain, numbness, and fatigue may take place with the increasing size of the tumor. The tumors are round or ovoid, eccentric and well encapsulated. They are usually 2.5cms in size but may grow up to 4-5 cms. The tumor is greyish, pink, yellow, brown or white in colour. They are solitary and found

along the anterior aspect of the extremities by the side of the nerves. EMG, MRI, and USG are helpful in the diagnosis. Surgical removal is usually curative.

Case Presentation

A 28-year-old male presented with a painless swelling in the volar aspect of right mid forearm of 10 years duration with complaints of increase in size of the swelling associated with pain for the past two years. He complained of pain and paresthesia in the median nerve distribution of the right hand. The swelling measured 6 cms in length and 5 cms in width. The swelling was mobile on the transverse axis and not on the longitudinal axis. There was no motor weakness. There was normal protective sensation present in the hand. Percussion over the nerve produced positive Tinel's sign. There was no family history of neurofibromatosis and no associated clinical features. The ultrasound showed

Author's Photo Gallery



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Figure 1: Intra-operative image of separating tumour from surrounding tissue.



Figure 2: Tumour in eccentric position of median nerve.



Figure 3: Macroscopic view of tumour after excision.

that the mass was subcutaneous although limited and homogeneous measuring 6 cm in diameter. The patient refused to undergo MRI examination due to financial constraints. A surgical workup and a pre-operative anaesthetist assessment were obtained. With a clinical diagnosis of median nerve tumor the patient was planned for excision of the tumor. The patient was explained regarding the neurological deficit following surgery and that she may need a sural nerve graft. The patient was taken up for surgery in supraclavicular block with bupivacaine and xylocaine under tourniquet control.

Adequate exposure of the nerve was done both proximal and distal to the tumour (Fig. 1). On exploration the tumour was found to be arising from the median nerve in the right mid forearm. It was a well encapsulated greyish tumour (Fig. 3) placed in an eccentric position to the axis of the nerve (Fig. 2). The vascular pedicle in the proximal part of the tumour is identified first and the remaining tumour was gently resected using microsurgical techniques. The specimen was sent for histopathological examination. Histopathological examination of the masses revealed typical features of schwannoma with presence of spindle cells forming Verocay bodies and clearly identified Antony A and B areas (Fig. 4). At two months follow-up the patient was symptom free with mild paresthesia in his index and middle fingers. There was no motor deficit or pain and no recurrence of the lumps (Fig. 5).

Discussion

Schwannomas are common, slowly growing, and encapsulated benign nerve sheath neoplasms separated from the surrounding tissues. These tumors are soft in consistency, mobile in nature, and sometimes painless so they may be misdiagnosed as lipoma, fibroma, ganglion, or xanthoma. Holdsworth [4], White [5], and Phalen [6] reported low rates of correct diagnosis. They most commonly occur in adults between 20 and 70 years of age with equal incidence among both genders. They generally appear as solitary lesions. Occurrence of multiple schwannomas is rare and not necessarily correlate with neurofibromatosis, which demonstrates very precise chromosomal alterations [7]. Malignant transformation of benign schwannomas is unusual [8], Schwannomas can be asymptomatic or can produce pain, a positive Tinel's sign or a Tinel's like sensation, and sensory alterations. The slow growth pattern of benign nerve tumours allows for adaptation of the nerve function to the pressure effects [9]. The slow growth and the nervous adaptation to the increased volume of the tumor is often the factor responsible for the diagnostic delay. In a study of 14 cases of schwannomas of the upper limb, Akambi Sanoussi and Dubert analysed the time between the onset of clinical symptoms and surgery; this period was nine months on average (two months to seven years) [10]. MRI can provide useful information about morphological data on the median nerve tumours; however, it cannot provide dynamic information [11]. Although low-intense signals on T1-weighted images and hyperintense signals on T2-weighted images are common findings of schwannomas [12], MRI also give useful information regarding tumor extent, anatomical location, tumor size, and relationship of peripheral nerve, and for appropriate planning of surgical therapy and preoperative diagnosis. EMG studies may reveal prolonged sensory latency and diminished or absent

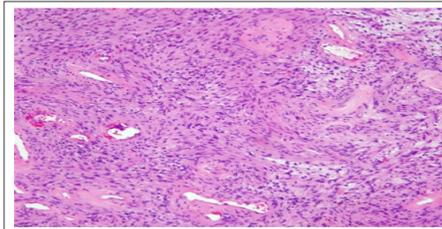


Figure 4: Histopathology of Schwannoma.



Figure 5: Patient at 2 months follow up.

sensory-evoked potentials [11, 13]. The risk of malignant transformation being approximated at 18% in neurofibromatosis type 1 and 5% in schwannomas.

Surgical excision is the treatment of choice. Schwannomas are theoretically removable because they repulse fascicular groups without penetrating them, thus allowing their enucleation while preserving nerve continuity [14, 15], as reported in our patient. Some authors recommend excision of only symptomatic tumours or those demonstrating enlargement during follow-up [16]. Other authors showed that the size of the tumour, longer history, or presence of preoperative neurological symptom correlated with the incidence of neurological deficit [17]. Careful microsurgical dissection in a bloodless field is important so the use of microscopical magnification are advised to avoid damaging the nerve fibres during the epineural and endoneurial dissection. Paresthesia is the most frequently reported postoperative complication. The surgeon must be careful not to make unnecessary sacrifice of functionally important motor and sensory branches. In this case, we also used microsurgical technique to remove the tumor and tried to protect the nerve. Nerve grafting may also be required in some malignant forms of these tumours [11, 18].

Conclusion

Benign tumours involving peripheral nerves of the upper extremity are uncommon. Schwannomas are theoretically removable because they repulse fascicular groups without penetrating them, thus allowing their enucleation while preserving nerve continuity, as reported in our patient, but the surgeon must be careful not to make unnecessary sacrifice of functionally important motor and sensory branches.

Clinical Message

Diagnosing the peripheral nerve schwannomas can be challenging. These may present in similar fashion like lipoma, ganglion, fibroma or xanthoma. Hence, a detailed clinical and radiological evaluation is essential. Surgical treatment is curative but using microsurgical techniques and saving the intact fibres of parent nerve. Peripheral nerve schwannoma is rare and observation of a single patient can add to our understanding of etiology, pathogenesis, natural history, and treatment of particularly that rare disease.

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