Journal of Peripheral Nerve Surgery (Volume 1, No.1, July 2017) 60-63

CASE REPORT

Brachial Plexus Schwannoma: A Case Report

Divya Narain Upadhyaya[1], Vaishali Upadhyaya[2], Smriti Bhushan[3]

Introduction

Schwannomas, also referred to as Neurilemmomas, are benign, encapsulated perineural tumours of neuro-ectodermal derivative that originate from the Schwann cells of the nerve sheath of motor and sensory peripheral nerves, cranial nerves or autonomic nerves. A schwannoma of the brachial plexus is a rare entity, which presents a diagnostic and therapeutic challenge to even an experienced surgeon. These account for only 5% of upper limb tumors[1]. Herein we present a case of a young man with brachial plexus schwannoma along with a brief review of current literature.

Case Report

A 36 year male presented to the out patient department with complaints of swelling in the left supra-clavicular region for 5 months and sharp shooting pain, tingling and numbness in the left upper limb for two months. The swelling had progressively enlarged with a marked increase in size over the last three months. He also complained of weakness in the left upper limb and difficulty in grasping objects with left hand. He did not give any history of a systemic illness, trauma or weight loss.

Clinical evaluation revealed a large globular swelling of approximately 6x4 cm in the left supra-clavicular region, which was soft in consistency, non-tender, non-compressible and appeared fixed to the underlying structure. There was no associated lymphadenopathy or pigmentation in the axilla or over body (axillary freckles and café-au-lait spots). Range of movements of the left shoulder, elbow, and wrist joints were normal. On overhead abduction of the left shoulder, the patient complained of tingling sensation in the left index finger. There was no evidence of muscle wasting and both, left thenar and hypothenar eminences were normal. The pulsations in the ipsilateral limb were normal with good volume. There was no history of fever, fainting attacks or seizures. A differential diagnosis of lymph node mass, neurofibroma and schwannoma was considered and the patient was evaluated accordingly.

A high-resolution ultrasound (HR-US) revealed a heterogenous mass in left supra-clavicular region, which had both solid and cystic components (Fig 1). Internal vascularity was seen in the solid component on color flow imaging. Fine needle aspiration cytology (FNAC) of the swelling suggested the lesion to be a benign mesenchymal neoplasm with cystic hemorrhagic degeneration, likely a nerve sheath tumor.

Magnetic resonance imaging (MRI) of the left supra-clavicular region was done for further evaluation of the mass along with Magnetic resonance neurography (MRN) of the left brachial plexus to delineate its relation to the roots, trunks and cords of the brachial plexus, since the patient had complained of tingling, numbness and pain in the ipsilateral upper limb. MRI demonstrated a well-defined, lobulated, heterogenous soft tissue mass with solid and cystic areas arising from the area of the trunks of the left brachial plexus. The cords were spared. The lesion did not involve the subclavian vessels. The findings suggested a neurogenic tumor, possibly a brachial plexus schwannoma (Fig 2). The patient was advised exploration and extirpative excision of the mass.

The neck was explored through a classical, extended, posteriorly based platysmal flap triangular incision over the left supraclavicular area (Fig 3). While dissecting in the posterior triangle of the neck between the anterior and middle scaleni muscles a spherical tumor was encountered between the roots and trunks of the brachial plexus (Fig 4).

Careful dissection under loupe magnification proximal and distal to the tumor revealed that the mass appeared to be arising from the C7 root and extending up to the level of the trunks, specifically the middle

✉ Divya Narain Upadhyaya
+91 9335252998
dnu1@hotmail.com

1 Department of Plastic Surgery, King George Medical University, Lucknow.

2 Department of Radiology, Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow.

3 Department of Plastic Surgery, King George Medical University, Lucknow.

trunk. The upper (C5, C6) and lower (C8, T1) trunks were plastered to the mass, and splayed by its pressure effect. The upper and lower trunk were carefully dissected free from the tumor and it was found that these structures were actually free from the tumor but adhered due to pressure effect of the mass in the small confines of the neck. C5, C6, C8, T1 roots were visualised and traced to their trunks and beyond. The root C7 was found to be traversing through the mass and was completely destroyed by it.The mass was excised preserving as many fascicles of the middle trunk as possible (Fig 5). After tumor excision the resulting cavity was lavaged with normal saline and closed in layers over suction drain.

The tumor was sectioned on table and was found to be solid as well as cystic with areas of jelly like necrotic material (Fig 6). The sectioned tumor was sent for histopathological/immunohistochemical examination to confirm the clinical diagnosis.

The histopathology report confirmed preoperative diagnosis of Schwannoma and sections showed benign cellular peripheral nerve sheath tumor predominantly Antoni A areas,with compactly arranged fascicles of ovoid to spindled cells with bland wavy nuclei having tapered ends, inconspicuous nucleoli, indistinct cell border and moderate amount of amphophilic cytoplasm. Numerous interspersed, variable-sized blood vessels were also seen. (Fig 7)

Immunohistochemistry was also performed on the tissue, which was reported as S100-Diffuse positive in tumor cells, CD34-Positve in vascular endothelial cells, negative in tumor cells, CK-Negative in tumor cells,Ki67<2%.

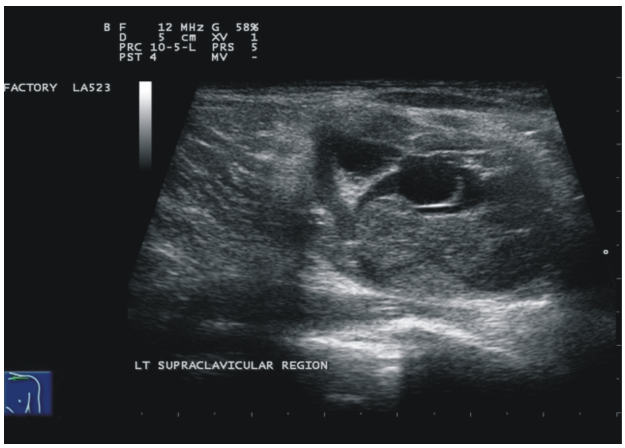

Fig. 1 High Resolution Ultra Sonography (HR-USG) of left supraclavicular area showing heterogenous mass in left supra-clavicular region, having both solid and cystic components.

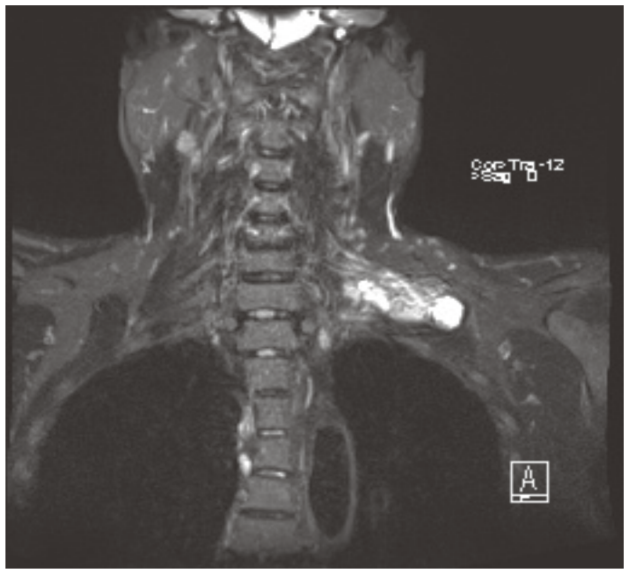

Fig. 2 MRI with MRN of the left brachial plexus showing well-defined, lobulated, heterogenous soft tissue mass with solid and cystic areas arising from the area of the trunks of the left brachial plexus

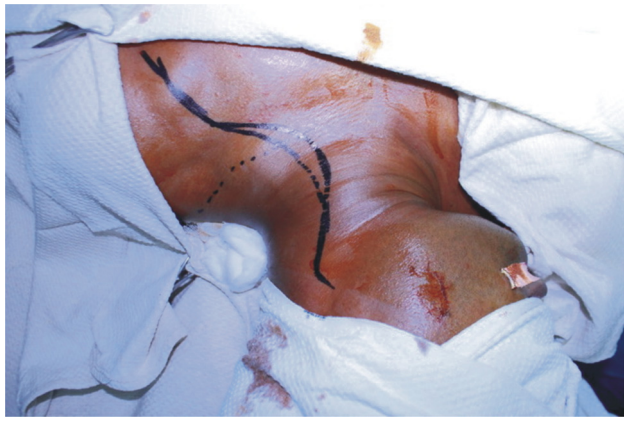

Fig. 3 Intra-operative photograph showing the classical, posteriorly based, triangular platysmal flap incision

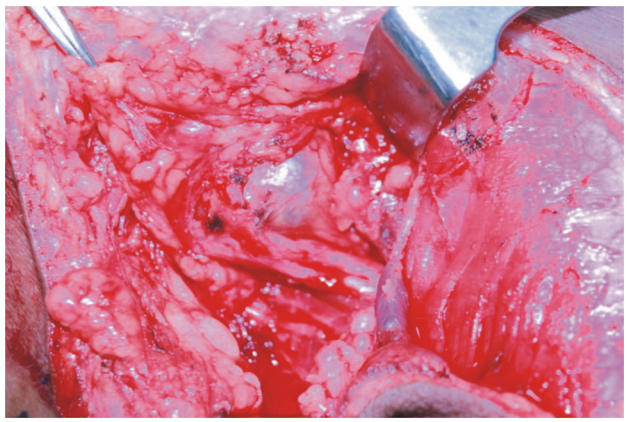

Fig. 4 Intra-operative photograph showing the spherical, well-defined tumor present in the inter-scalene space between the roots and trunks of the left brachial plexus

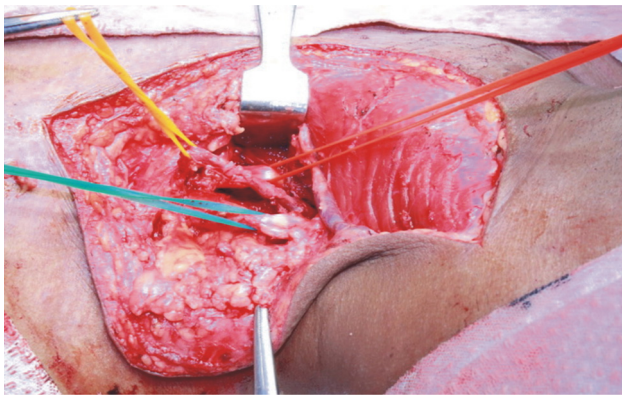

Fig. 5 Intra-operative photograph showing the upper, middle and lower trunks of the left brachial plexus after extirpation of the mass.

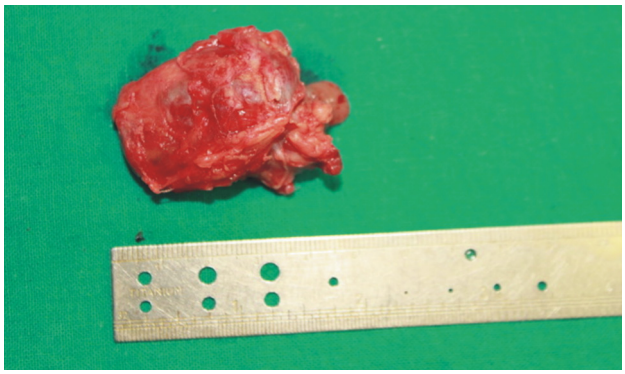

Fig. 6 Intra-operative photograph showing the excised schwannoma.

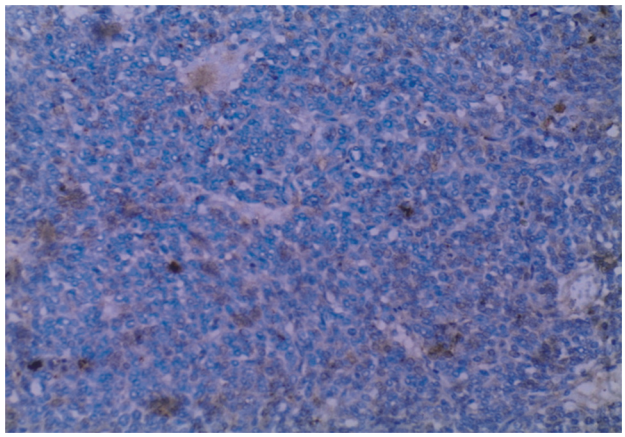

Fig. 7 Histopatholgy

A histopathological diagnosis of schwannoma was thus made. The post-operative course of the patient was unremarkable. The patient reported relief from the excruciating pain that he had presented with. There was no discernible sensory-motor deficit in the ipsilateral upper limb. Elbow extension remained as MRC 4+ grade.

Discussion

Large swelling in the supra-clavicular region of young adult can be a diagnostic enigma for a surgeon. Brachial plexus tumors are rare and account for about 5% of the tumors of the upper limb[1]. Schwannoma of the brachial plexus is the commonest of the brachial plexus tumors accounting for almost 70% of them. Schwannoma is a slow growing benign tumour with a rare malignant transformation and presents commonly between second and fourth decade of life. Most of the patients of brachial plexus schwannoma present with a palpable mass in the supra-clavicular region, followed by paresthesia, numbness, and radiating pain[2]. The symptoms occur due to compression of the surrounding nerves[3] and nerve roots and they can be locally destructive if allowed to progress, as was found in our case where the tumor had completely destroyed the C7 root. Increased growth and symptoms may herald a malignant transformation or cystic degeneration (as happened in our case) of tumor, which happens in almost 40% of cases[4].

Imaging is an important tool in the diagnosis of brachial plexus tumors and for documentation of the structures involved by the tumor. A recent study has revealed the significance of 18 fluoro-deoxyglucose Positron Emission Tomography and Computed Tomography (FDG-PET/CT) in the diagnosis of axillary and sub-clavian brachial plexus schwannnoma[5]. Schwannomas appear as well defined solitary mass lesions causing displacement of the fascicles on MRI[4]. They may also be found encasing nerve roots or may appear as diffuse growth along the brachial plexus.

Retrospective studies have found surgical resection of schwannomas as an acceptable modality of treatment in improving symptoms with minimal morbidity[3]. Gross total resection is possible in most of the benign brachial plexus tumors. A detailed pre-operative evaluation and a meticulous surgery promises the best outcome for a symptomatic brachial plexus schwannoma patient.

References

1. Rashid M, Salahuddin O, Yousaf S, Qazi U A, Yousaf K. Schwannoma of the Brachial Plexus; Report of two cases involving the C7 root. J Brachial Plex Peripher Nerve Inj. 2013; 8(1): 12.
2. Patel M L, Sachan R, Seth G, Radheshyam. Schwannoma of the Brachial Plexus: A Rare Cause of Monoparesis. BMJ Case Rep 2013; doi:10.1136/bcr-2012-008525.

3. Soltani AM. Neural Sheath Tumors of the Brachial Plexus: A Multidisciplinary Team-Based Approach. Annals of Plastic Surgery; 71(1): 80-83.
4. Somayaji K S G, Rajeshwari A, Gangadhara K S. Schwannoma of the Brachial Plexus presenting as a Cystic Swelling. Indian Journal of Otolaryngology and Head and Neck Surgery. 2004; 56(3): 228-230.
5. Boulanger X, Ledoux J B, Brun A L, Beigelman C. Imaging of the Non-traumatic Brachial Plexus. Diagn Interv Imaging. 2013; 94(10): 945-956.