Journal of Advances in Medical and Pharmaceutical Sciences
7(2): 1-5, 2016, Article no.JAMPS.24527
ISSN: 2394-1111

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Brachial Plexus Middle Trunk Schwannoma: A Case Report with Uncommon Localization and Literature Review

N. Irawati[1*], R. Walukow[1], D. Hari Susilo[1], E. H. Kusumastuti[2] and S. Reksoprawiro[1]

[1]Department of Surgery, Head and Neck Surgery Unit, Dr. Soetomo General Hospital, Surabaya, Indonesia.
[2]Department of Pathology, Dr. Soetomo General Hospital, Surabaya, Indonesia.

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMPS/2016/24527
Editor(s):
(1) Manash K. Paul, Gompert's Lab, Department of Pediatrics Hemato-Oncology, University of California, USA.
Reviewers:
(1) M. G. Binu, ESIC Medical College and Hospital, India.
(2) Wenyin Shi, Thomas Jefferson University, USA.
(3) Abrao Rapoport, São Paulo University, Brazil.
Complete Peer review History: http://sciencedomain.org/review-history/13977

Case Study

Received 24th January 2016
Accepted 14th March 2016
Published 1st April 2016

ABSTRACT

Aim: We report a case of schwannoma arising from the middle trunk of the right brachial plexus and presented with radiating pain down to lower arm. The patient developed temporary neurological deficit after surgery.
Presentation of Case: A 30- year old patient presented with history of lump on right lower neck in last nine months. The patient did not have a significant complaint, but occasionally felt sharp pain which was radiating down to right lower arm. USG of the neck showed a hypoechoic soft tissue mass with posterior acoustic enhancement and FNAC suggested of schwannoma.
Discussion and Conclusion: This case report indicates uncommon location of schwannoma in the neck related to symptoms that may occur as the mass increases in size. In our case, we report a case with involvement of the middle trunk of the brachial plexus, which is relatively rare for

**Corresponding author: E-mail: ikbinwittelily@yahoo.com;*

schwannoma to appear. Surgical excision is the treatment of choice, with recurrence being rare. Excision of the tumor without injuring the parent nerve demands detailed preoperative planning and meticulous dissection. This case highlights the importance of understanding anatomy of surrounding structures to prevent serious complications post operatively.

Keywords: Brachial plexus tumors; middle trunk; Schwannoma.

1. INTRODUCTION

Schwannomas are benign tumor of Schwann cell origin [1]. About 25% of schwannoma occur in the head and neck. Previous studies have reported all sites of origin, such as cranial nerves IX-XII, sympathetic chain, cervical and brachial plexus [1,2]. Schwannomas of the brachial plexus are rare, occurring in 0.3-0.4/100.000 person per year [3-5]. Donner et al reported a 5% incidence rate for schwannomas localized in the supraclavicular brachial plexus. It usually appears as a painless mass and when it becomes bulky, it can give compression symptoms such as local pain and paresthesia. Although malignant transformation is extremely low, but they can be locally destructive if allowed to progress. MRI and CT Scan may help in differentiating this disease before surgery. Confirmation can be obtained by histopathology examination. Due to their rarity and complex anatomical location, they may create a dreadful challenge to surgeons [6].

2. CASE PRESENTATION

A 30-year-old Indonesian woman had presented to our Head and Neck Surgery clinic with a nine-month history of a lump on the right side of the lower neck. The mass continued to increase in size, but did not limit neck's movement. The patient also complained about sharp radiating pain down to right lower arm. There was no history of tobacco or irritant use. On physical examination a 3x2 cm, firm to tensely cystic, oval, semi fixed, well demarcated mass was noticed and palpated in the posterior triangle. It was not associated with any changes in the overlying skin, but the pain that went down to right middle finger was triggered by applying pressure to the tumor and appeared after exertion. An examination of the other neurological status was unremarkable. Marked hypotonia and muscle weakness were not found and sensory modality such as touch, temperature and pinprick was normal.

On investigation, complete blood count, random blood sugar, liver and kidney function tests were normal. Thorax x-ray did not reveal any abnormality. Due to the patient's poor socio-economy status, any imaging studies like CT Scan or MRI could not be done, therefore neck ultrasound was performed and it showed a heterogenous hypoechoic soft tissue mass with posterior acoustic enhancement and multiple cystic lesion within the mass in the right posterior neck, measuring about 2.98 × 2.18 x 3.37 cm in its greatest dimension, with mildly increased peripheral vascularization. A possibility of schwannoma was suggested (Fig. 1).

A fine-needle aspiration cytology (FNAC) was obtained and the histological finding of the tissue showed benign spindle shaped cells with wavy nuclei embedded in a fibrillar and myxoid matrix , suggestive of schwannoma.

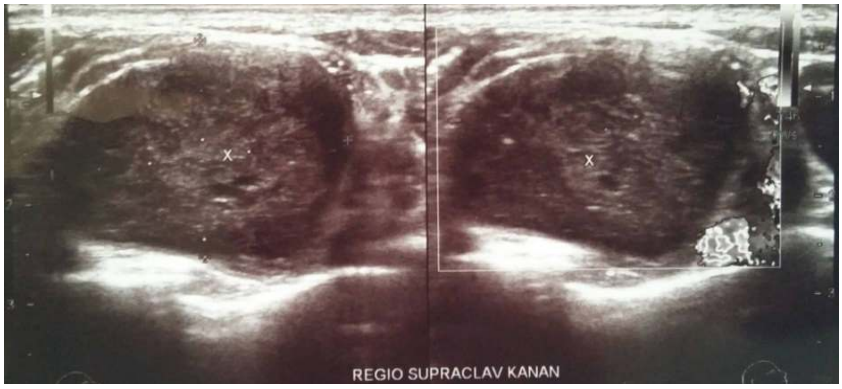

Fig. 1. USG image

The case was diagnosed as schwannoma of the right brachial plexus and the patient underwent a mass excision with preservation of all the main brachial trunks under general anesthesia. An anterior supraclavicular approach was used. Sternocleidomastoid muscle was displaced medially and a well encapsulated cystic mass originated from the middle trunk of the brachial plexus. After gross identification of the tumor, the mass was carefully separated from the nerve trunk without damaging the nerve sheath and preservation of all the three main trunks was achieved (Figs. 2-4). Post operatively, the patient had minimal sensory and motor deficit.

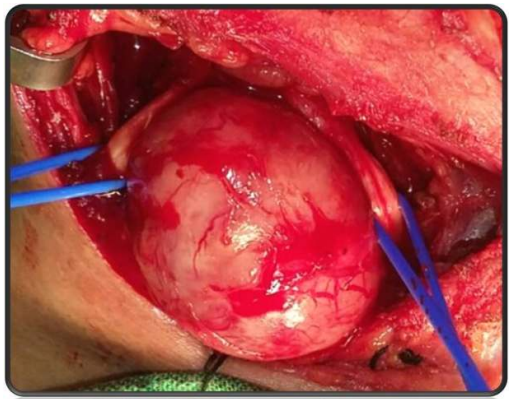

Fig. 2. Schwannoma of middle trunk brachial plexus

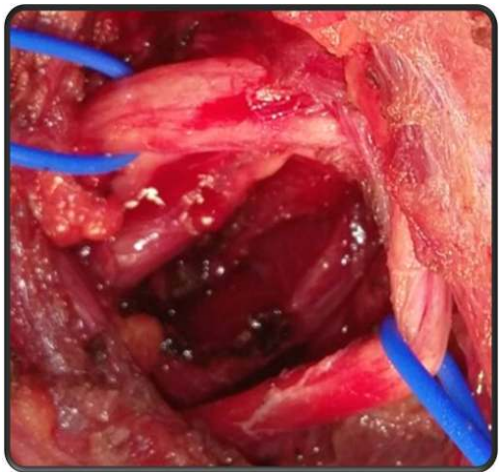

Fig. 3. Post excision of schwannoma with intact parent nerve

Histological analysis of the excised tissue showed proliferation of spindle cells arranged in palisading pattern, forming Verocay body (Antoni A) and relatively few cellular regions in myxoid interstitial tissue (Antoni B configuration). No cytological atypia was noted. The above findings consistent with a tissue diagnosis of schwannoma (Figs. 5 and 6). The patient was discharged on the fifth postoperative day and underwent daily rehabilitation practice. Six months later the patient did not show any relapse. Paresthesia, sensory and motor deficit are completely resolved.

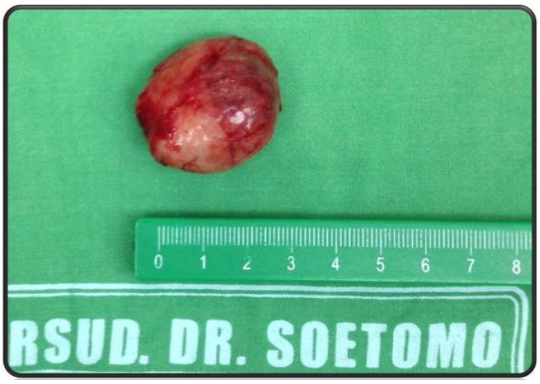

Fig. 4. Size of the mass

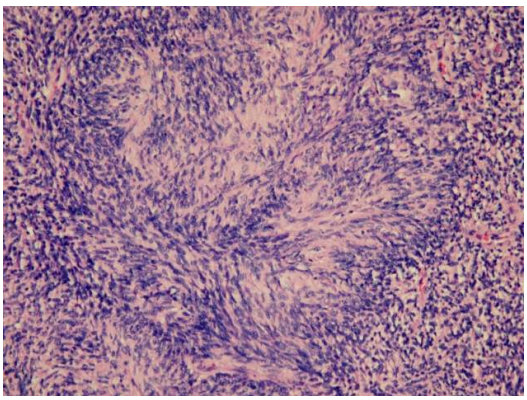

Fig. 5. Antoni A area. Compact spindle cells, wavy

3. DISCUSSION

Neurogenic tumors of head and neck are uncommon tumors that can arise from cranial, peripheral, and autonomic nerves. The vast majority are benign and include neurofibromas and schwannomas [1].

Schwannoma of the brachial plexus is extremely uncommon [6]. It usually appears as benign well encapsulated mass originating from the nerve sheath. Most often occur in the 3rd and 4th decades of life and women are affected more often than men, with reported ratio between 2:1 and 3:2 [7]. Patient's initial symptoms include

progressively growing mass in supraclavicular region, direct tenderness, local pain, numbness and loss of function. Involving symptoms attributed to nerve compression should raise suspicion and further examination with MRI is advisable [8].

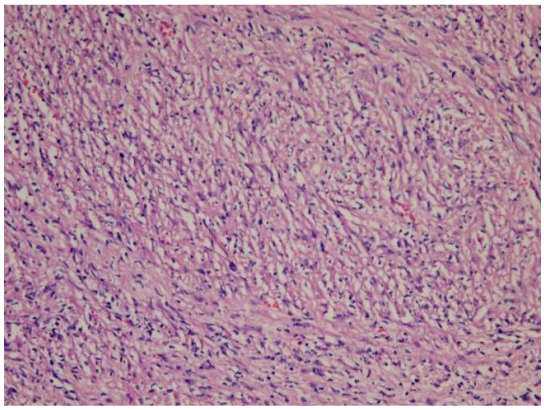

Fig. 6. Antoni B area, hypocellular area

FNAC has been recommended as the first initial testing procedure, it may give a diagnosis in a quarter of cases. The predominant feature is the presence of spindle cells with distinct Antoni A and B components, hyaline vessels, and nuclear palisading [9,10].

The role of CT scan has been replaced by MRI examination. MRI is the study of choice to delineate the margins of the tumor from surrounding tissues with greatest contrast and source of the mass. However, it is currently unable to differentiate between schwannoma and neurofibroma [11,12]. In the diagnosis of this case, because of our limitation to do CT scan or MRI, we had to rely on history, positive finding on clinical and cytology examination and also ultrasound result to create a working diagnosis. As in our case, we concluded that although ultrasound able to determinate suspicious schwannoma lesion but it offered very limited information about source of the mass and surrounding vital structures pre operatively.

The surgical management of schwannoma is less clear cut with cautious dissection. Surgical enucleation or 'peeling off' is still the treatment of choice of this lesion, in order to relieve patient's symptoms and minimize a possible neural damage. However in majority cases, it is feasible to do complete resection and preserving all vital surrounding nerves, because of their eccentric and non-infiltrating growth. Any nerve injury should be repaired by primary anastomosis or nerve graft [8]. One literature reported 4% incidence of malignancy in schwannoma from 146 cervical schwannoma cases, hence by some authours for oncologic reason, partial excision or enucleation is inadvisable [13,14].

Radiation and chemotherapy have no definite role in the management of uncomplicated cervical schwannoma. The use of these adjuvant modalities should only be considered for large, deep, high grade disease which demonstrates metastase or metastastic potential [15,16].

4. CONCLUSION

Schwannoma should be included in differential diagnoses when confronted with lateral supraclavicular neck mass especially with sign of neural compression. Preoperative diagnosis is very important, therefore imaging studies such as CT Scan or MRI are strongly suggested. Knowledge of the trunk involved assists in preoperative counseling about possible neurological sequelae post excision. In spite of the rarity of this location (brachial plexus), the mandatory therapy is surgery, where the complex anatomy is a real challenge to surgeons, even after MRI and CT scan for evaluation pre surgical approach. Care should be taken to preserve the nerve function during dissection.

CONSENT

All authors declare that written informed consent was obtained from the patient for publication of this paper and accompanying images

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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