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CASE REPORT

The Schwannoma of the Upper Mediastinum Originating from Nervus Vagus: an Unusual Case Report

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Abstract

Schwannoma is a neurogenic tumor, usually with posterior mediastinum localization arising from the intercostal nerves and is primarily benign. It is also known that rarely, it may show the malignant transformation. It is usually asymptomatic and incidentally emerges as a solitary mass on plain radiography. A 49-year-old male patient was admitted to our hospital with a chronic cough complaint. A well-circumscribed mass of 6 × 5 × 3 cm in size, detected in the right para-tracheal space on computed tomography, was excised by right thoracotomy. Histopathological diagnosis has been reported as schwannoma. Schwannomas with thorax localization originating from different neural structures are quite rare. We present a rare case of schwannoma with successful management in this article.

Keywords Schwannoma · Nervus vagus · Computed tomography

Introduction

Benign nerve sheath tumors are the most common neurogenic tumors of the mediastinum in adult patients. Schwannomas that can be found almost anywhere in the body can be caused by the sheaths of the peripheral motor, sensory, cranial, or sympathetic nerves. Schwannomas with intrathoracic localization are generally located in the posterior mediastinum and are known as tumors associated with the intercostal nerves. The anterior mediastinum is an infrequent location for schwannomas [1]. We present the schwannoma case due to its rare place and tissue of origin.

Case Report

A 49-year-old male patient was admitted for thoracal mass with a chronic cough complaint. Routine laboratory and systemic examinations were within normal limits. His own and family history had no feature, and he was not a smoker. A well-circumscribed radiopaque lesion of approximately 5 × 5 cm, extending from the superior mediastinum to the right apical zone, was detected on the chest roentgenogram (Fig. 1A). In thorax computed tomography (CT), a 6 × 5 × 3 cm well-circumscribed solid mass was reported in the right para-tracheal space (Fig. 1B). Right thoracotomy was administered to the patient. In exploring the upper-right para-tracheal region, a 5–6-cm well-circumscribed mass pressing the trachea and upper-right lobe apical segment, lobulated, in dirty yellow color, capsulated, smoothly curved, and coursing in the right nervus vagus was detected. The mass was totally excised by protecting the nervus vagus (Fig. 1C). The patient, whose chest drain was removed on the 2nd postoperative day, was discharged from the hospital without any complication on the 4th day. The patient,

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Fig. 1 **A** On the chest scanogram, a 5×5 cm well-circumscribed radiopaque lesion was detected in the right apical zone. **B** In the thorax coronal reformatted computed tomography image, a 6×5×3 cm well-circumscribed solid mass is observed in the right para-tracheal zone. **C** Macroscopic image of the tumoral mass

whose pathology result is reported as benign schwannoma, is in follow-up after the operation for 6 months without any complaint.

Discussion

The schwannomas are incidentally detected in lung images with asymptomatic. They are primarily located in the dorsal mediastinum and originate from intercostal nerves. Depending on their locations, they may exhibit symptoms in response to pressure. The ones in the thorax entrance may come with satellite ganglion pressure and Horner syndrome. The ones originating from the intercostal nerve may come with pleuritic side pain, those with spinal extension may come with paresthesia or paralysis, and those with brachial plexus retention may come with arm pains. In contrast, patients whose esophagus or trachea is under pressure may have swallowing difficulties, coughing, or difficulty breathing [2]. Sugio et al. have reported that 2% of all the neurogenic tumors are originating from the nervus vagus [3]. Sakumoto et al. have informed that only 1 of 15 patients with mediastinal neurogenic tumor, whom they applied surgery, originated from nervus vagus [4]. In proportion to one intra-thoracic location, the neck-located schwannomas are more frequently arising from the nervus vagus. de Araujo et al. have reported that among 22 cervical-nerve-originated schwannoma cases they operated on, only seven patients were vagus-originated [5]. There are also cases detected in literature due to the findings related to the trachea or esophagus invasion [6, 7]. Schwannomas are well-circumscribed solitary masses in lung graphics and thorax CTs. Calcification and cystic changes may occur. Although schwannomas are generally benign, they may cause death due to the pressure effect. For this reason, it has been reported that radical surgical resection is required in their treatment regardless of their malign or benign character. Schwannomas are not radio-sensitive. No recurrence is observed when the tumor is removed [2]. Oosterwijk and Swierenga have reported the malignity incidence of mediastinal schwannomas to be 13–20%. Twenty-five percent of the malign cases are accompanied by "Von Recklinghausen" disease. If there is malign transformation, postoperative adjuvant radiotherapy is recommended [8]. In histopathological examination, two patterns, Antoni A and Antoni B are observed under the capsule (Fig. 2A). The Antoni A regions are

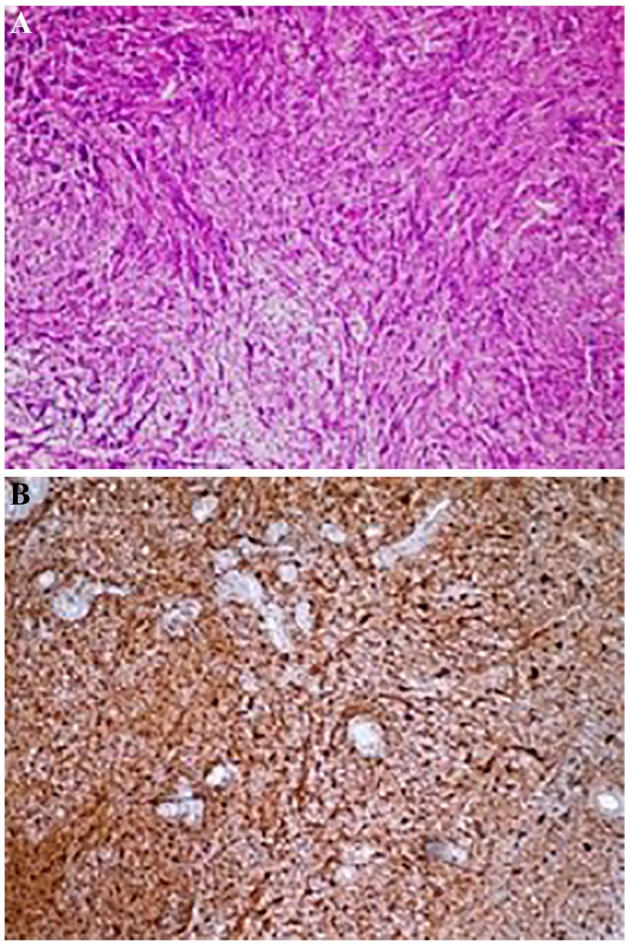

Fig. 2 Histological analysis of the mass. **A** Hematoxylin and eosin staining: spindle-shaped tumor cells were observed. **B** Immunohistochemical staining: S-100 protein was positive in tumor cells

the hypercellular regions, where the density of nucleated fusiform cells is high, and the Antoni B regions are hypocellular. Moreover, the immunohistochemical examination is performed in case of diagnosis difficulties. There are S-100 protein-positive cells in schwannomas [9]. Our patient was also reported to be S-100 positive (Fig. 2B).

Conclusion

All thoracic nerve structures can include schwannomas in different locations since they originate from the nerve sheath, such as the nervus vagus. It may be associated with a bulky appearance and may bring pre-operative misdiagnoses. The operation ensures both the diagnosis and the treatment.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s42399-022-01227-9.

Author Contribution AY: conceptualization, methodology, acquisition of literature, writing the original draft. HA: designing the study, obtaining the images, and writing the original draft. HS: providing surgery and collecting data. All authors read and approved the final manuscript.

Data Availability All data generated or analyzed during this study are included in this published article.

Code Availability Not applicable.

Declarations

Ethics Approval Appropriate ethical review and informed consent protocols were followed. Ethical approval is not required for case reports in our institution.

Consent to Participate The patient consented to the publication of this case report and accompanying images.

Consent for Publication All the authors have given their consent for publication.

Conflict of Interest The authors declare no competing interests.

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