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Case Report

Intrathora cic Schwannoma: Case Report of an Unexpected Diagnosis in an Unsuspecting Patient

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ABSTRACT

Background and Aim: Schwannoma is a rare benign neoplasm of neural cells originating from Schwann cells. It is mostly asymptomatic but can cause other distracting symptoms. In this report, we discussed a rare case of intercostal schwannoma presenting with asthma.

Case Presentation: A 65-year-old female, with a history of asthma from 12 years ago, was referred to a hospital due to worsening shortness of breath. A chest X-ray revealed a large round mass in the right lung. The computed tomography of the chest demonstrated a large, well-circumscribed mass. The patient was transferred to our hospital for surgical removal of the mass. After thoracotomy, a huge solid mass measuring 20×10×10 cm was removed. Histological examination showed an intercostal nerve schwannoma. She had an uneventful recovery period, and her asthmatic symptoms resolved.

Conclusion: Our case further demonstrates that intercostal Schwannoma can have an unusual presentation. If left undiagnosed and untreated, these tumors may lead to long-term medical issues.

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Introduction

Schwannomas are benign nerve sheath tumors with a relatively good prognosis. Early diagnosis and appropriate management are crucial for minimizing symptoms and preserving nerve function. Regular follow-ups are necessary to monitor for any potential recurrence, especially in cases where complete resection is not achieved [1]. Schwannoma is the most common benign tumor of the peripheral nerve sheath. It arises from Schwann cells and is usually encapsulated, slow-growing, and solitary. It often originates from spinal or proximal intercostal nerves [2]. Herein, we discussed a rare presentation of an intrathoracic schwannoma that was misconceived as asthma.

Case Presentation

A 65-year-old female with a history of asthma and hypertension presented to the emergency department (ED) of a local hospital with worsening shortness of breath (SOB) and cough. Her SOB had developed 12 years ago, characterized by episodic attacks that were not related to activity. There was no history of fever, myalgia, weight loss, chest pain, etc. She was primitively diagnosed with asthma at that time, but despite taking medications, her symptoms had not improved. Unfortunately, she did not have appropriate follow-up care and consequently stopped taking her medication. In recent months, she also reported a vague pain in her left hemithorax that prompted her to visit the hospital. Her pain had no association with activity and did not radiate. Additionally, she noted that the frequency of her episodes of dyspnea had increased and that these episodes were not associated with chest pain. Upon arrival, her vital signs were as follows: Blood pressure 130/86 mmHg, heart rate 75 beats per minute, respiratory rate 18 breaths per minute, body temperature 98.6 °F, and oxygen saturation 97% on room air.

She was given aminophylline, dexamethasone, and salbutamol plus oxygen therapy, although her symptoms persisted. Subsequently, a chest X-ray revealed a large mass in the right lung (Figure 1). A spiral chest computed tomography (CT) scan was carried out and demonstrated a cystic mass arising from the right thoracic wall, which narrowed the carina and right main bronchus (Figure 2). Thus, the patient was transferred to another hospital with a suspicion of a hydatid cyst. Upon arrival at the new hospital, her vital signs had changed to 165/85 mmHg for blood pressure, 85 beats per minute for heart rate, and a respiratory rate of 20 breaths per minute. Physical examination yielded no pathologic findings except reduced right upper lung sounds, and the heart auscultation sound was normal. No lymphadenopathies and masses were palpated, and her trachea was not deviated. She had a normal abdominal examination, and there were no signs of edema, rashes, or clubbing in her extremities. Electrocardiography revealed a normal sinus rhythm, and echocardiography demonstrated a left ventricle ejection fraction of 55%. Laboratory studies were within normal limits. After thoracotomy, a huge solid mass measuring 20×10×10 cm was found in her right thoracic cavity, suggesting a tumor arising from intercostal nerves. The tumor was located adjacent to the carina and exerted a mass effect, which may have caused all the patient's symptoms over the last 12 years. We dissected the tumor from the intercostal nerve, and the tumor was sent for pathologic examination. The pathologic studies revealed schwannoma. The patient recovered uneventfully and is now leading a normal life.

Discussion

Neural neoplasms can arise from any peripheral nerve, but intercostal nerve tumors are less common than those in the mediastinum. They may present with no symptoms; however, if the patient does become symptomatic, radiating pain along the affected nerve is usually the first sign [3]. Malignant neurological tumors will often present with symptoms in children, but adults tend to experience fewer symptoms. On the other hand, benign neurological tumors tend to remain asymptomatic for much longer and can go unnoticed for extended periods [4]. Schwannomas are benign tumors that consist of Schwann cells, which form the outermost layer of nerve fibers. They most commonly present as individual tumors and are located in either the cranial or peripheral nerves [5]. The symptoms of the disease can differ based on the tumor's size and location [6]. A Schwannoma is likely to cause a palpated mass, and tapping or percussion of the affected nerve can also result in paresthesia in some cases [7]. Our patient presented an unusual case of a large intercostal nerve Schwannoma that caused SOB and coughing. Some years later, she began to experience pain in the left side of the chest, which did not appear to be linked to paresthesia due to the tumor's location. Histologically, Schawannomas consist of two types of areas: Antoni A and Antoni B. Antoni A is a cellular area of Schwann cells arranged in a cellular distribution, while Antoni B is a less cellular and loose myxoid component. Both areas can present in a schwannoma [8]. Grossly, these tumors are generally well-circumscribed and may

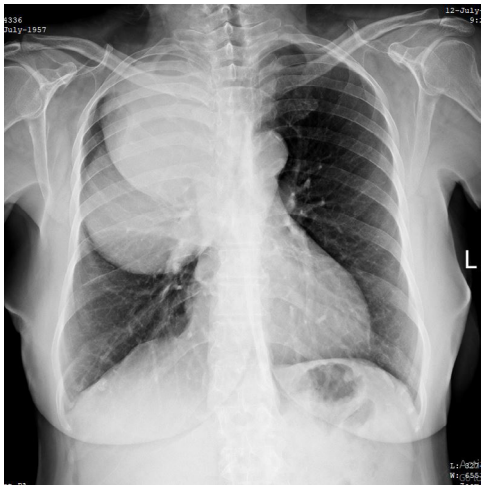

Figure 1. A large mass in the right hemithorax on chest x-ray

exhibit degenerative changes [9]. On CT scans, these tumors often show a homogenous mass [10]. Similarly, our patient's CT scan revealed a circumscribed homogenous mass that resembled a mediastinal hydatid cyst.

Furthermore, an upright chest X-ray revealed a large mass on the right side of the chest. Generally, complete surgical resection is the preferred treatment option for these patients, and a wide surgical resection can help prevent malignant transformation [11]. As shown in the table, intrathoracic Schwannomas can occur in people of all ages and are often asymptomatic, going undetected for extended periods (Table 1). Some of these tumors may be diagnosed incidentally, while others might cause mass effects, such as compressive effects on the trachea, leading to symptoms. Cough and dyspnea were the main complaints of some patients [4, 12-17]. Similarly to our case, they could be misdiagnosed as asthma [17].

Several potential limitations are inherent to all studies. One limitation of the current study is the lack of access to the patient's complete medical documentation history. Earlier medical records may have provided insight into why the disease remained undiagnosed for an extended duration. The restricted availability of historical medical records constrained the research team's ability to gain a holistic view of the patient's case and likely influenced the observations and conclusions drawn. In conclusion, we encountered an uncommon presentation of a thoracic Schwannoma arising from an intercostal nerve. It is recommended that physicians include a Schwannoma in their differential diagnosis list for patients presenting with symptoms, such as coughing and SOB.

Conclusion

This study demonstrated that the diagnosis of intrathoracic tumors, particularly schwannomas, can be chal-

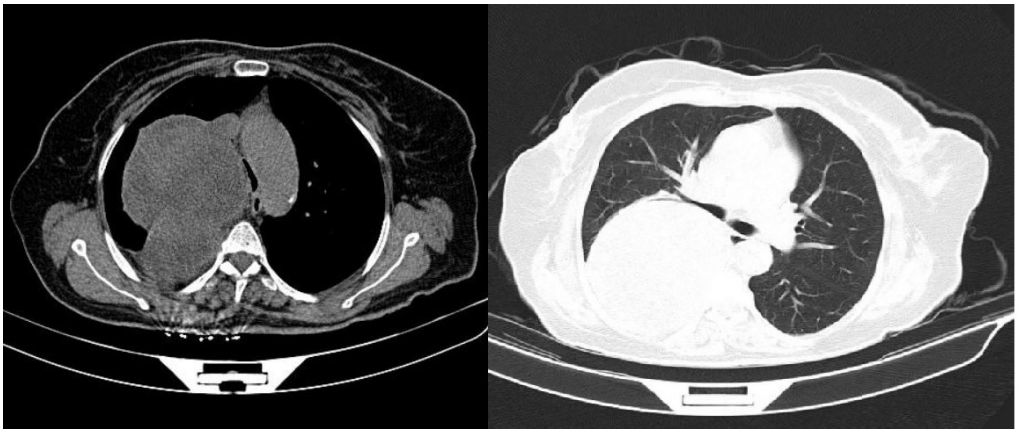

Figure 2. A large mass in the right pleural space on CT scan

CT scan: Computed tomography scan.

Table 1. Some case reports of thoracic schwannomas during the last decade

Author(s)	Year	Patient Characteristics	Clinical Presentation	Tumor Size	Location of the Tumor
Saleemi et al. [12]	2022	A 43-year-old male	Shortness of breath and chest pain	10×15×12 cm	Left-sided spinal T6-T7 foraminal/intrathoracic Schwannoma
Morris et al. [13]	2021	A 70-year-old female	Chronic cough and progressive dyspnoea	13 cm	Intercostal nerve
Sayit and Elmali [18]	2020	A 48-year-old male	Recurrent left-side flank pain	8x10 cm	Posterior mediastinum in a left paravertebral location
Kato et al. [14]	2011	A 72-year-old female	Cardiogenic shock and hypoxia with a history of exercise-induced dyspnea and right chest pain during the last weeks	14×10 cm	Intrathoracic vagus nerve
Wu et al. [15]	2016	A 45-year-old male	Cough and choking sensation	20×15×12 cm	The paravertebral sympathetic nerve in the right lower side of the chest
Akgül et al. [19]	2012	A 33-year-old male	Left-sided pain	5x4.5x3.5 cm	Intercostal nerve
Loftus et al. [16]	2018	A 57-year-old female	Exertional dyspnea and cough	13 cm	Posterior mediastinal
Feng et al. [20]	2020	A 42-year-old male	Intermittent left chest wall pain for 6 years	5x2 cm	Intercostal nerve
Gueldich et al. [17]	2015	A 44-year-old female	Nocturnal dyspnea with cough, which did not respond to asthmatic therapy and worsening of the dyspnea	4x8 cm	Left recurrent laryngeal nerve with cervical extension
Sun et al. [21]	2018	A 54-year-old female	Progressive dull left chest pain over one year	5×5cm, 3×4 cm, and 1.5×1.5 cm	Multiple (three) schwannomas along the third intercostal nerve
Savu et al. [4]	2020	A 60-year-old female	Decreased tolerance to physical activity and dyspnea	20.5×12.5×9 cm	Right fourth intercostal nerve
Yao et al. [22]	2016	A 44-year-old male	Severe back pain for 12 years	14 mm	Intraosseous Schwannoma of the right seventh rib
Ertekin and Öcalan [23]	2022	A 18-year-old female	Incidentally after traumatic hemothorax	15×20 cm	Costophrenic space of the left hemithorax
Shanmugasundaram et al. [24]	2019	A 26-year-old male	2 years of dyspepsia and vague upper back pain	7.4×6.5×5.6 cm	Left upper mediastinal space

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lenging and requires careful attention to clinical symptoms and imaging. Patients who typically present with nonspecific respiratory symptoms or chest pain may be affected by these types of tumors, which are often diagnosed at more advanced stages. Early diagnosis and appropriate management of these tumors can improve treatment outcomes and the quality of life for patients. This serves as a reminder for physicians to consider the possibility of rare tumors when evaluating clinical symptoms and to utilize advanced imaging techniques for accurate diagnosis. Ultimately, this study emphasizes the importance of interdisciplinary collaboration in managing these types of tumors and highlights the need for further research to better understand their clinical and therapeutic characteristics.

Ethical Considerations

Compliance with ethical guidelines

Written informed consent was obtained from the patient for the publication of the article and any associated images.

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Authors' contributions

All authors contributed equally to the conception and design of the study, data collection and analysis, interception of the results, and manuscript drafting. Each author approved the submission of the final version of the manuscript.

Conflict of interest

The authors declared no conflict of interest.

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References

[1] Karna MB, Kinanta PBS, Aprilya D. Recurrent schwannoma of digital nerve on both hands: A very rare case report. Int J Surg Case Rep. 2023; 103:107915. [DOI:10.1016/j.ijscr.2023.107915] [PMID]

[2] Nakazono T, White CS, Yamasaki F, Yamaguchi K, Egashira R, Irie H, et al. MRI findings of mediastinal neurogenic tumors. AJR Am J Roentgenol. 2011; 197(4):W643-52. [DOI:10.2214/AJR.10.6119] [PMID]

[3] McClenathan JH, Bloom RJ. Peripheral tumors of the intercostal nerves. Ann Thorac Surg. 2004; 78(2):713-4. [DOI:10.1016/j.athoracsur.2003.09.022] [PMID]

[4] Savu C, Grigorie V, Melinte A, Diaconu C, Iliescu L, Dimitriu M, et al. Giant intrathoracic schwannoma: A case report. In Vivo. 2020; 34(6):3527-32. [DOI:10.21873/invivo.12194] [PMID]

[5] Chen F, Nakayama E, Okubo K, Date H. Intrathoracic multiple schwannomas of a single intercostal nerve. Ann Thorac Surg. 2008; 86(2):660-1. [DOI:10.1016/j.athoracsur.2008.02.004] [PMID]

[6] Rodríguez CA, Munhoz AH, Zampier JA, Silva AP, Fustes OH. [Benign intercostal nerve schwannoma simulating pulmonary neoplasm: Case report (Portuguese)]. Arq Neuropsiquiatr. 2004; 62(4):1100-3. [DOI:10.1590/S0004-282X2004000600032] [PMID]

[7] Stumpo M, Poppi M, Rizzo G, Martinelli P. Intercostal neuralgic schwannoma: A case report. Muscle Nerve. 2002; 25(5):753-4. [DOI:10.1002/mus.10093] [PMID]

[8] Pavlus JD, Carter BW, Tolley MD, Keung ES, Khorashadi L, Lichtenberger JP 3rd. Imaging of thoracic neurogenic tumors. AJR Am J Roentgenol. 2016; 207(3):552-61. [DOI:10.2214/AJR.16.16018] [PMID]

[9] Rodriguez FJ, Folpe AL, Giannini C, Perry A. Pathology of peripheral nerve sheath tumors: Diagnostic overview and update on selected diagnostic problems. Acta Neuropathol. 2012; 123(3):295-319. [DOI:10.1007/s00401-012-0954-z] [PMID]

[10] Tateishi U, Gladish GW, Kusumoto M, Hasegawa T, Yokoyama R, Tsuchiya R, et al. Chest wall tumors: Radiologic findings and pathologic correlation: Part 1. Benign tumors. Radiographics. 2003; 23(6):1477-90. [DOI:10.1148/rg.236015526] [PMID]

[11] Simon NG, Talbott J, Chin CT, Kliot M. Peripheral nerve imaging. Handb Clin Neurol. 2016; 136:811-26. [DOI:10.1016/B978-0-444-53486-6.00040-5] [PMID]

[12] Saleemi MS, Abdelwahab AOY, Abdelwahab MOY, George KJ. A case of a giant thoracic schwannoma. Surg Neurol Int. 2022; 13:188. [DOI:10.25259/SNI_151_2022] [PMID]

[13] Morris PD, Chuong B, Meredith G. Giant ancient intercostal schwannoma: A rare cause of chronic cough and progressive dyspnoea. ANZ J Surg. 2021; 91(11):E734-6. [DOI:10.1111/ans.16780]

[14] Kato M, Shiota S, Shiga K, Takagi H, Mori H, Sekiya M, et al. Benign giant mediastinal schwannoma presenting as cardiac tamponade in a woman: A case report. J Med Case Rep. 2011; 5:61. [DOI:10.1186/1752-1947-5-61] [PMID]

[15] Wu Y, Zhang J, Chai Y. Giant mediastinal schwannoma located in the lower right side of the chest. Niger J Clin Pract. 2016; 19(5):678-80. [DOI:10.4103/1119-3077.188701] [PMID]

[16] Loftus TJ, Pipkin M, Machuca T, Oduntan O. Angiographic embolization followed by piecemeal resection of giant posterior mediastinal schwannoma: Case report and concise review. Int J Surg Case Rep. 2018; 53:250-3. [DOI:10.1016/j.ijscr.2018.10.055] [PMID]

[17] Gueldich M, Hentati A, Chakroun A, Abid H, Kammoun S, M'saad S, et al. Giant cystic schwannoma of the middle mediastinum with cervical extension. Libyan J Med. 2015; 10(1):27409. [DOI:10.3402/ljm.v10.27409] [PMID]

[18] Sayit AT, Elmali M. Rare presentation of a posterior mediastinal cystic schwannoma. Cukurova Med J. 2020; 45(2):760-2. [DOI:10.17826/cumj.700358]

[19] Akgül AG, Çobanoğlu U, Yurt ZK. An asymptomatic schwannoma originating from an intercostal nerve: A case report. Turk J Thorac Cardiovasc Surg. 2012; 20(3):662-4. [DOI:10.5606/tgkdc.dergisi.2012.132]

[20] Feng WH, Liu T, Huang TW, Chen YY. Schwannoma of the intercostal nerve manifesting as chest pain. Ann Thorac Surg. 2020; 110(4):e281-3. [DOI:10.1016/j.athoracsur.2020.02.044] [PMID]

[21] Sun WK, Yang W, Ma CH, Xiao XW, Shi Y, Song Y. Multiple intercostal neurilemmomas in a Chinese woman. J Cancer Res Ther. 2018; 14(S):S1220-2. [DOI:10.4103/jcrt.JCRT_540_16] [PMID]

[22] Yao T, Otsuka H, Koezuka S, Makino T, Hata Y, Ishiwatari T, et al. Intraosseous Schwannoma of Rib with severe back pain and characteristic pathological findings. Ann Thorac Surg. 2016; 102(2):e155-7. [DOI:10.1016/j.athoracsur.2016.01.008] [PMID]

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Qom University of Medical Sciences

[23] Ertekin A, Öcalan K. Detection of incidental schwannoma by traumatic hemothorax. Ulus Travma Acil Cerrahi Derg. 2022; 28(3):399-401. [DOI:10.14744/tjtes.2020.62290]

[24] Shanmugasundaram G, Thangavel P, Venkataraman B, Barathi G. Incidental ancient schwannoma of the posterior mediastinum in a young male: A rare scenario. BMJ Case Rep. 2019; 12(5):e227497. [DOI:10.1136/bcr-2018-227497] [PMID]