Plexiform schwannoma of the chest wall, resection and costal osteotomy. A case report

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Case Report

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Background: Mediastinal tumors comprise a heterogeneous group of entities with diverse histological origins, with neurogenic tumors being the most frequent in the posterior mediastinum. Among these, schwannomas are benign lesions derived from Schwann cells, while plexiform schwannoma represents a rare variant characterized by multinodular growth. Its localization in the chest wall is exceptional, posing a diagnostic and therapeutic challenge.

Case report: We present the case of a male patient in his eighth decade of life with a progressive tumor lesion of the right chest wall, associated with radiating pain and weight loss. Histopathological examination confirmed plexiform schwannoma. Complete surgical resection was performed with costal osteotomy, fixation, and prosthetic reconstruction. The patient evolved favorably, with respiratory recovery and hospital discharge without major complications.

Discussion: Plexiform schwannoma of the chest wall is an extremely rare entity. Its clinical presentation may mimic malignant chest wall lesions, making histopathological diagnosis essential. Complete surgical excision remains the treatment of choice, with excellent prognosis and low recurrence rates.

Conclusion: Plexiform schwannoma should be considered in the differential diagnosis of chest wall tumors. Timely surgical management allows favorable outcomes and preservation of respiratory function, even in cases with bone involvement.

Keywords: Plexiform schwannoma, Chest wall tumor, Neurogenic mediastinal tumor.

Mediastinal tumors constitute a heterogeneous group of pathological entities encompassing a wide spectrum of benign and malignant diagnoses, with variable clinical presentations depending on their location, size, and relationship to adjacent structures. Their overall incidence is low; however, they represent a significant diagnostic and therapeutic challenge in specialized clinical and surgical practice [1,2].

Anatomically, the mediastinum is divided into anterior, middle, and posterior compartments, with the posterior mediastinum being the most frequently affected by tumors of neurogenic origin. Approximately 53.9% of posterior mediastinal masses correspond to neurogenic tumors, followed by benign cysts (13.9%) and lymphomas (5%) [3,4]. Although neurogenic tumors may occur in any mediastinal compartment, between 71% and 95% are located in the posterior mediastinum, typically arising from spinal nerve roots, intercostal nerves, or the sympathetic trunk [5].

Mediastinal neurogenic tumors are classified according to their histological origin into nerve sheath tumors, tumors derived from nerve cells, and paraganglionic tumors. Among benign nerve sheath tumors, schwannomas and neurofibromas are the most common, accounting for up to 90% of cases [6]. Schwannomas, also known as neurilemmomas, arise exclusively from Schwann cells and usually present as well-circumscribed, encapsulated, slow-growing lesions [7].

Plexiform schwannoma is an uncommon variant characterized by a multinodular or plexiform growth pattern, which may lead to diagnostic confusion with malignant lesions or plexiform neurofibromas, particularly when occurring in atypical locations such as the chest wall [8]. Given its low frequency and nonspecific clinical presentation, case reports are essential to expand clinical, radiological, and therapeutic knowledge of this entity.

Case report

A male patient in his eighth decade of life presented with no history of chronic-degenerative diseases, previous surgeries, fractures, or blood transfusions. He had a positive smoking history since the age of 11 years, with an average consumption of

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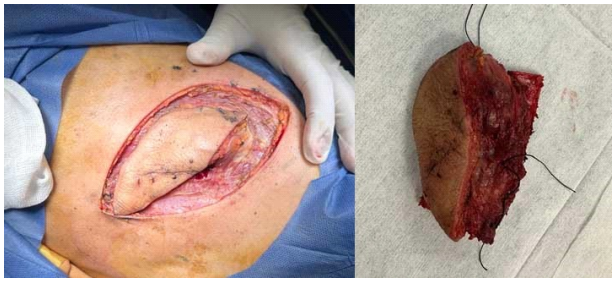

Figure 1. Thoracic tumor, delimited and dissected by layers, measuring 5 x 3 cm.

18 cigarettes per day. He reported occasional alcohol use, discontinued five years prior, and denied illicit drug use.

Regarding the present illness, the patient reported a tumor lesion located in the eighth rib of the right hemithorax, which he had detected approximately one year earlier and which had shown progressive growth. He also experienced a weight loss of approximately 8 kg over six months, along with radiating pain in a belt-like distribution toward the ipsilateral dorsal region.

On March 21, 2025, a biopsy of the chest wall lesion was performed. A mass was identified at the level of the sixth and seventh right costal arches, adherent to deep planes, with regular borders and an approximate size of 2 × 5 cm. Histopathological examination was consistent with plexiform schwannoma (neurilemmoma).

On April 10, 2025, complete tumor resection was performed with costal osteotomy, rib fixation, placement of a prosthetic mesh, and a pulmonary expansion system. Surgical findings revealed a lesion measuring approximately 5 × 3 cm involving the same costal arches, firmly adherent to deep planes, as well as multiple dense adhesions between the right lung and the chest wall.

During the immediate postoperative period, the patient developed respiratory difficulty requiring supplemental oxygen via nasal cannula. Respiratory therapy with incentive spirometry was initiated, resulting in progressive improvement in ventilatory effort and hospital discharge four days after surgery.

Discussion

Plexiform schwannoma of the chest wall represents an extremely rare entity within the spectrum of neurogenic tumors, with very few cases reported in the literature. This variant is characterized by growth along multiple nerve fascicles, producing a distinctive morphological pattern that may simulate more aggressive lesions [8,9].

Extrapleural thoracic or costal wall localization is unusual, as most intrathoracic schwannomas develop in the posterior mediastinum, arising from the sympathetic trunk or intercostal

Figure 2. Local tumor resection with loss of rib cage and surrounding soft tissues.

nerves [5,10]. This atypical location complicates the differential diagnosis, which includes neurofibromas, soft tissue sarcomas, metastatic tumors, and primary chest wall lesions [11].

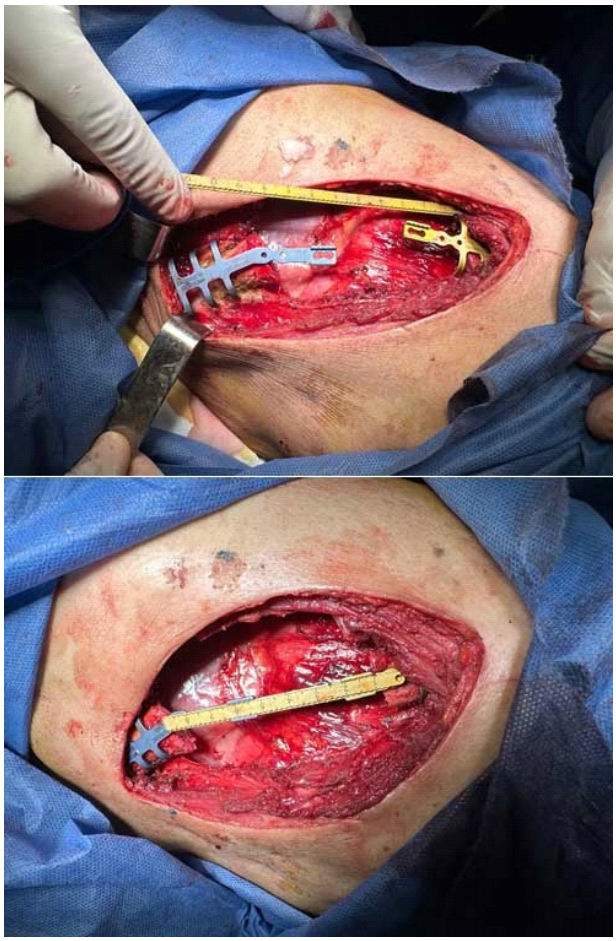

Figure 3. Placement of rib mesh to stabilize the rib cage at the 7th rib level

Clinically, schwannomas are often asymptomatic and detected incidentally. When symptoms occur, they are related to mass effect,

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compression of adjacent structures, or irritation of intercostal nerves, producing radiating pain in a belt-like distribution, as observed in the present case [7,10]. Weight loss, although uncommon in benign tumors, may be present in progressively enlarging lesions or those associated with chronic pain.

Histopathological evaluation is essential for definitive diagnosis, demonstrating Antoni A and Antoni B areas, along with immunohistochemical positivity for S-100 protein, characteristic of Schwann cell–derived tumors [6,9]. In plexiform schwannoma, accurate identification is crucial to differentiate it from plexiform neurofibroma, which is associated with neurofibromatosis type 1 and carries a higher risk of malignant transformation [12].

Currently, there is no effective medical therapy for schwannomas. Complete surgical excision remains the treatment of choice, offering excellent outcomes, low recurrence rates, and favorable prognosis when adequate margins are achieved [1,5]. In cases involving the chest wall, bone resection and prosthetic reconstruction may be necessary, as performed in this patient, to preserve thoracic stability and respiratory function.

Given the rarity of this presentation, the present case contributes to the existing literature and highlights the importance of including plexiform schwannoma in the differential diagnosis of chest wall tumors, as well as the value of timely surgical intervention.

Conclusion

Plexiform schwannoma of the chest wall is an exceptionally rare benign neurogenic tumor that may present with progressive growth and symptoms related to local nerve irritation or mass effect. Due to its atypical location, it can mimic malignant chest wall neoplasms, making histopathological confirmation essential for accurate diagnosis. Complete surgical excision remains the definitive treatment, providing excellent clinical outcomes, low recurrence rates, and preservation of thoracic stability and respiratory function when appropriate reconstruction is performed. Increased awareness of this rare entity is important to ensure timely diagnosis and optimal management.

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