



## Case report

## Solitary fibrous tumor of the pleura mimicking a soft tissue sarcoma of the chest wall

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## ABSTRACT

**Introduction and importance:** Solitary fibrous tumors of the pleura (SFTPs) present a diagnostic challenge. We herein report a successful case mimicking a soft tissue sarcoma of the chest wall by a meticulous evaluation of the conventional images.**Case presentation:** A 51-year-old woman presented with a left thoracic mass. The mass exhibited an extrapleural sign, which suggested a chest wall origin. However, the mass was found to be located more caudally by additional computed tomography. This positional change suggested that the mass was pedunculated from the visceral pleura, and an SFTP was suspected. The mass was found to originate from the visceral pleura of the left lower lobe and a pathological diagnosis of an SFTP was confirmed.**Clinical discussion:** Although a positional shift with a postural change or the respiratory phase is a well-known characteristic radiological finding, such an intentional imaging study is available only for suspicious cases of SFTPs.**Conclusions:** SFTPs pose a diagnostic challenge because of their rarity and the lack of specific radiological findings. Even conventional radiological images can be diagnostic by performing a meticulous evaluation regardless of any specific diagnosis being initially assumed.

## 1. Introduction

Most pleural tumors are metastatic, and primary tumors are uncommon and account for only for 5% [1]. Solitary fibrous tumors of the pleura (SFTPs) are one of the most frequent pleural neoplasms originating mostly from the visceral pleura [2]. A preoperative diagnosis is challenging due to its rarity and the lack of specific radiological findings. Although a positional shift with a postural change or the respiratory phase is a characteristic finding, it would be feasible only in the suspicious cases of SFTP [3,4]. We herein report a case of a successful preoperative diagnosis by a meticulous radiological evaluation of conventional images. This work has been reported in line with the SCARE criteria [5].

## 2. Case presentation

A 51-year-old woman presented with a left thoracic mass

incidentally found by chest computed tomography (CT) during a workup for a left cervical lymphadenopathy. She had rheumatoid arthritis treated with methotrexate for 7 years. She had no smoking history or any familial history of malignancy. The chest CT revealed a well-defined, spindle-shaped mass adjacent to the left 10th and 11th ribs (Fig. 1). The mass also exhibited an extrapleural sign that suggested a sessile growth from the chest wall (Fig. 2). We suspected that the mass was a soft tissue sarcoma involving the chest wall, which deemed to require a wide local resection with a chest wall reconstruction. Contrast-enhanced CT to investigate the arterial supply to the anterior spinal cord around the mass did not identify the Adamkiewicz artery (AKA) [6]. In addition, the mass was also found to be located more caudally adjacent to the 12th rib than the initial imaging suggested (Fig. 1b). This positional change suggested that the mass was pedunculated from the visceral pleura and was not a sessile growth from the chest wall. We suspected an SFTP because of its pedunculated visceral pleural origin and planned a thoracoscopic surgery by an attending thoracic surgeon at

**Abbreviations:** SFTP, Solitary fibrous tumors of the pleura; AKA, Adamkiewicz artery.

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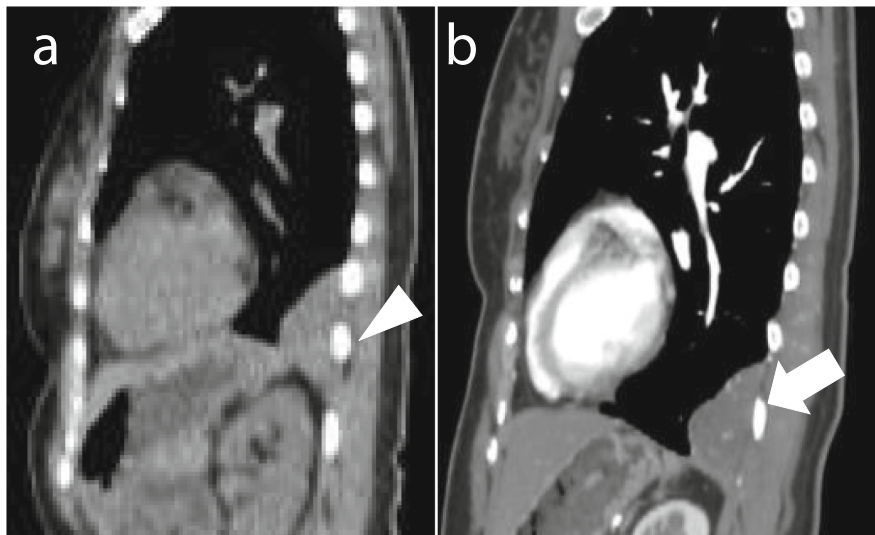
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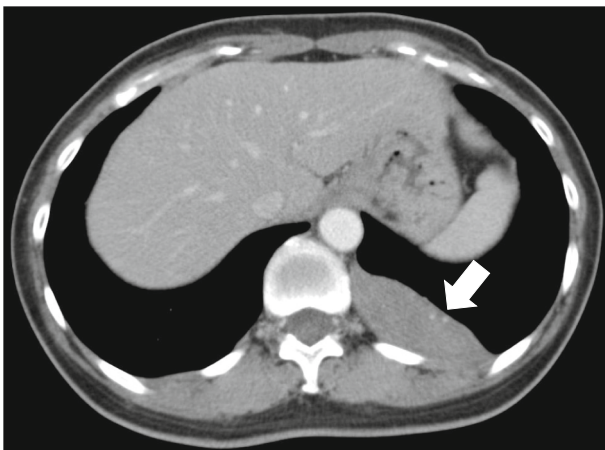
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**Fig. 1.** a: The mass was adjacent to the left 10th and 11th ribs (arrowhead) on the initial chest CT scan.  
b: A contrast-enhanced CT scan showed that the mass was located more caudally and adjacent to the left 12th rib (arrow).

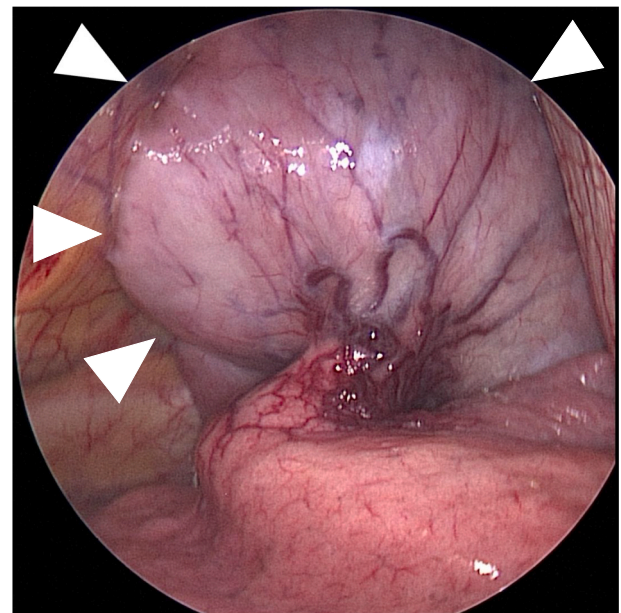


**Fig. 2.** The mass (arrow) exhibited an extrapleural sign that suggested a sessile growth from the chest wall.

our institute. The mass was found to have originated from the visceral pleura of the left lower lobe (Fig. 3) and a wedge resection of the lung was performed. A histologic examination revealed proliferation of the tumor cells, consisting mainly of spindle-shaped cells and some round cells without cellular atypia. Immunohistochemistry revealed a CD34+, vimentin+ (Fig. 4), bcl2+, and Ki67 positivity of 4%, which was consistent with an SFTP. The postoperative course was uneventful, and she has currently been disease free for 5 years after the surgery.

### 3. Discussion

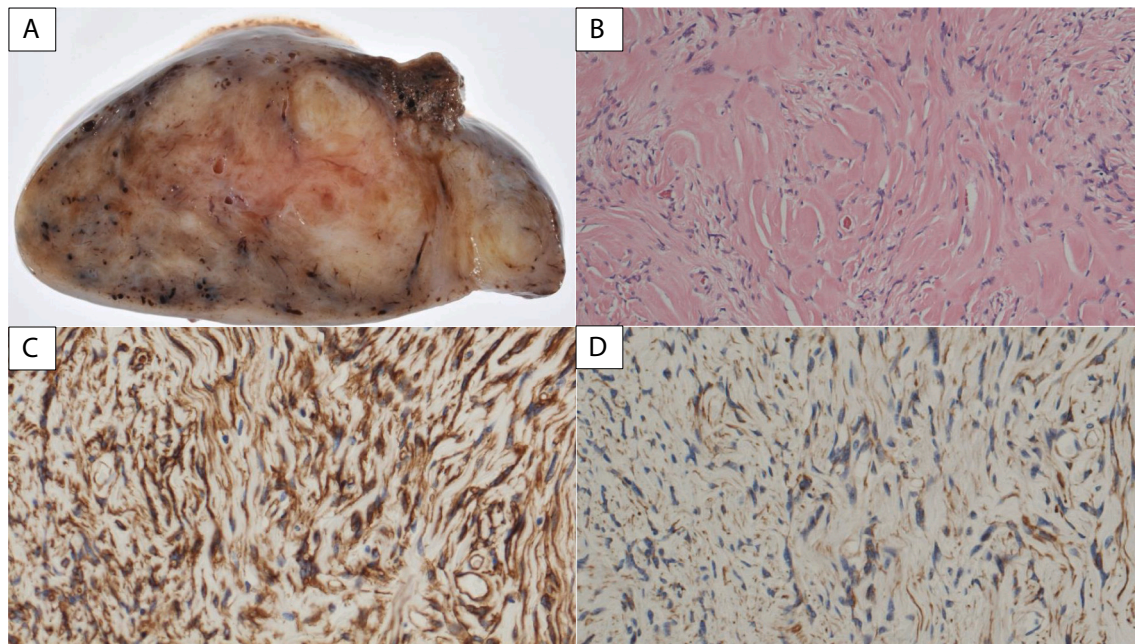
A preoperative diagnosis of an SFTP is challenging because of its rarity and the lack of specific radiological findings. We suspected that the mass was derived from the chest wall because of the extrapleural sign in the present case [7]. A soft tissue sarcoma was the most likely diagnosis, and a wide local resection with the chest wall was proposed during the initial workup [8,9]. We therefore evaluated the blood supply of the AKA by an additional contrast-enhanced CT to investigate the necessity for vascular reattachment to avoid spinal ischemia [10,11]. This additional test revealed an unexpected finding of the positional change of the mass, which suggested that the lesion was not anchored to



**Fig. 3.** An operative view revealed a pedunculated mass (arrow heads) arising from the visceral pleura of the left lower lobe.

the chest wall but was derived from the visceral pleura. These results eventually led us to the diagnosis of an SFTP, which is one of the most frequent visceral pleural tumors, and was confirmed histopathologically after the surgery.

If an SFTP had been suspected during the initial workup, an intentional imaging study in different positions or respiratory phases might have been diagnostic [12–14]. However, we did not have the slightest doubt of an SFTP at that time and incidentally detected the subtle but significant migration of the mass. Without a meticulous imaging analysis, we could not even have raised the differential diagnosis with an SFTP. The present case reminded us of the diagnostic significance of a meticulous evaluation of the conventional images regardless of whether any specific illness is suspected or not.



**Fig. 4.** A: The cut surface of the surgical specimen revealed an encapsulated mass. B: A histologic examination revealed the proliferation of the tumor cells, consisting mainly of spindle-shaped cells and some round cells without cellular atypia. C: The tumor cells had a diffuse positivity for CD34. D: The tumor cells had a positivity for vimentin.

#### 4. Conclusions

SFTPs pose a diagnostic challenge because of their rarity and the lack of specific radiological findings. However, even conventional radiological images can be diagnostic by performing a meticulous evaluation regardless of any specific diagnosis being initially assumed.

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Availability of data and material

Not applicable.

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#### CRedit authorship contribution statement

KW wrote this paper. YO reviewed the pathological findings. All

authors read and approved the final manuscript.

#### Declaration of competing interest

The authors declare that they have no competing interests.

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#### References

- [1] E.G. Theros, D.S. Feigin, Pleural tumors and pulmonary tumors: differential diagnosis, *Semin. Roentgenol.* 12 (1977) 239–247.
- [2] M. Briselli, E.J. Mark, G.R. Dickersin, Solitary fibrous tumors of the pleura: eight new cases and review of 360 cases in the literature, *Cancer* 47 (1981) 2678–2689.
- [3] M. Truong, R.F. Munden, B.L. Kemp, Localized fibrous tumor of the pleura, *AJR Am. J. Roentgenol.* 174 (2000) 42.
- [4] R.J. Hallifax, A. Talwar, J.M. Wrightson, A. Edey, F.V. Gleeson, State-of-the-art: radiological investigation of pleural disease, *Respir. Med.* 124 (2017) 88–99.
- [5] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, Group S, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, *Int J Surg* 84 (2020) 226–230.
- [6] J.H. Skalski, M. Zembala, Albert Wojciech adamkiewicz: the discoverer of the variable vascularity of the spinal cord, *Ann. Thorac. Surg.* 80 (2005) 1971–1975.
- [7] B. Felson, The extrapleural space, *Semin. Roentgenol.* 12 (1977) 327–333.
- [8] M.S. Gordon, S.I. Hajdu, M.S. Bains, M.E. Burt, Soft tissue sarcomas of the chest wall. Results of surgical resection, *J. Thorac. Cardiovasc. Surg.* 101 (1991) 843–854.
- [9] S. Tsukushi, Y. Nishida, H. Sugiura, H. Nakashima, N. Ishiguro, Soft tissue sarcomas of the chest wall, *J. Thorac. Oncol.* 4 (2009) 834–837.
- [10] M.B. Shadmehr, H.A. Gaissert, J.C. Wain, A.C. Moncure, H.C. Grillo, L.F. Borges, et al., The surgical approach to “dumbbell tumors” of the mediastinum, *Ann. Thorac. Surg.* 76 (2003) 1650–1654.
- [11] A.B. Nordin, S.C. Fallon, A. Jea, E.S. Kim, The use of spinal angiography in the management of posterior mediastinal tumors: case series and review of the literature, *J. Pediatr. Surg.* 48 (2013) 1871–1877.
- [12] A.S. Berne, E.R. Heitzman, The roentgenologic signs of pedunculated pleural tumors, *Am. J. Roentgenol. Radium Therapy, Nucl. Med.* 87 (1962) 892–895.
- [13] G.L. Weisbrod, A.C. Yee, Computed tomographic diagnosis of a pedunculated fibrous mesothelioma, *J. Can. Assoc. Radiol.* 34 (1983) 147–148.
- [14] L.A. Robinson, Solitary fibrous tumor of the pleura, *Cancer Control* 13 (2006) 264–269.