

An unusual isolated anterior mediastinal lesion

Nicholas Quigley  | Loic Lang-Lazdunski | Catherine Boily-Daoust |
Christian Couture | Marc Fortin 

Department of Pulmonary Medicine and Thoracic Surgery, Institut Universitaire de Cardiologie et de Pneumologie de Québec, Québec, Québec, Canada

Correspondence

Marc Fortin, Department of Pulmonary Medicine and Thoracic Surgery, Institut Universitaire de Cardiologie et de Pneumologie de Québec-Université Laval, 2725 Chemin Ste-Foy, Québec, QC G1V 4G5, Canada.
Email: marc.fortin@criucpq.ulaval.ca

Associate Editor: Kazuhisa Takahashi

Abstract

Malignant pleural mesothelioma (MPM) is an infrequent tumour of poor prognosis with a strong association with asbestos exposure. Pleural effusion or thickening is the most common radiological finding. Thoracoscopic biopsy is the diagnostic modality of choice. In our report, we present the case of a career welder who consulted with vocal cord palsy and an atypical anterior mediastinal lesion. An EBUS-TBNA-guided biopsy and a thorough cytological assessment led to an unexpected diagnosis of epithelioid MPM. A localized anterior mediastinal lesion is an extremely infrequent presentation of MPM that deserves clinical recognition.

KEYWORDS

asbestos, lymph node, mediastinal lesion, mesothelioma, vocal cord paralysis

INTRODUCTION

Malignant mesothelioma is an infrequent tumour arising from the serosal surfaces of the pleura or more rarely, the peritoneum, the pericardium, and the tunica vaginalis. An asbestos inhalational exposure is documented in more than 70% of cases along with a dose-response relationship.¹ Symptoms, such as chest pain, cough, dyspnea, fatigue and weight loss are insidious and non-specific. Radiologically, the most common finding is a unilateral pleural effusion. Nodular or diffuse pleural thickening on computed tomography (CT) is suggestive of the disease, but no radiologic modality is sufficient to support the diagnosis. A cytologic or pathologic specimen must be obtained.

We hereby report a case of malignant pleural mesothelioma (MPM) presenting as an isolated anterior mediastinal mass in an individual with hoarseness.

CASE REPORT

A 61-year-old-male, career welder, presented to his primary care physician with progressive voice hoarseness but was otherwise asymptomatic. He had a 25 pack-years smoking history but had quit smoking for more than 20 years. He was initially referred to the otorhinolaryngology service which confirmed a right vocal cord paralysis by

rhinolaryngoscopy. Chest radiograph proved unremarkable. On physical examination, the only noticeable finding was a hoarse voice.

CT of the neck, thorax, and abdomen demonstrated a 28 × 25 × 15 mm lesion of the antero-superior mediastinum which was felt to represent an enlarged lymph node at the junction of stations 4R and 3a (Figure 1A–C). It was suspected to cause right laryngeal recurrent nerve impingement. There were no other anomalies found, such as lymphadenopathy, metastasis, pleural effusion, or pleural lesion. Further investigations included a magnetic resonance imaging (MRI) of the brain and a flexible bronchoscopy which both proved non-contributory. Positron emission tomography (PET) demonstrated the mediastinal lesion to be strongly hypermetabolic without other sites of hypermetabolism.

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) was then performed. The mediastinal lesion was observed in the upper right paratracheal region and measured at 15 mm. The endoscopic appearance was not that of a typical lymph node but rather a hypoechoic lesion without sharp margins seeping into the pretracheal region between the brachiocephalic artery and veins.

Cytologic analysis of a fine needle aspiration revealed tridimensional clusters of malignant epithelioid cells with no lymphoid background. Immunohistochemically, these cells were reactive for anti-sera directed against calretinin, Wilms' tumour-I, podoplanin/D2-40, cytokeratins 5/6 and AE1/3

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *Respirology Case Reports* published by John Wiley & Sons Australia, Ltd on behalf of The Asian Pacific Society of Respiriology.

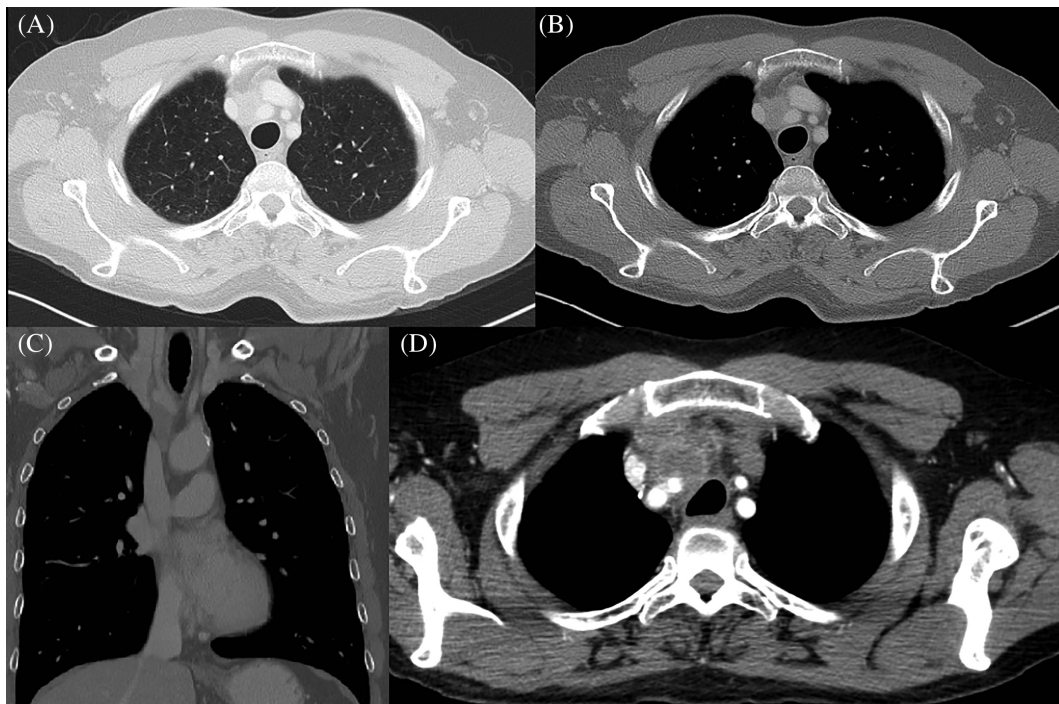


FIGURE 1 CT of the neck, thorax and abdomen demonstrating a $28 \times 25 \times 15$ mm lesion of the antero-superior mediastinum at the junction of stations 4R and 3a. Panel a shows axial images in lung window of the lesion at presentation, B axial images in mediastinal window at presentation, C coronal images in mediastinal window at presentation and D axial images in mediastinal window at 3 months demonstrating rapid progression

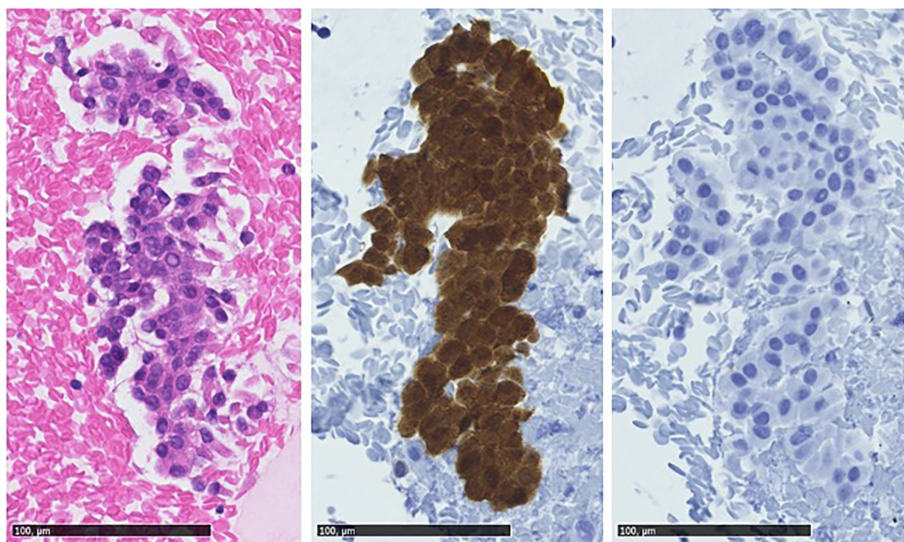


FIGURE 2 Cytologic analysis of a fine needle aspiration. Haematoxylin–eosin stain demonstrates a cluster of atypical epithelioid cells (left). Strong diffuse nuclear and cytoplasmic immunoreactivity for calretinin confirms mesothelial lineage (center). Absence of expression of claudin 4 excludes both carcinomatous and benign mesothelial lesions (right). Bar scale 100 μ m

but not for thyroid transcription factor-1 (TTF-1), napsin A, p40, cytokeratin 20, BerEP4, and claudin 4. These findings established the mesothelial lineage of the malignant epithelioid cells (Figure 2). It was concluded that there was no other plausible diagnosis than malignant epithelioid mesothelioma. The professional asbestos exposure of our patient further supported the diagnosis.

On repeat CT performed 3 months after the initial imaging (Figure 1D), the mass had grown to 6.1 cm in diameter and was now closely surrounding the right carotid artery, the superior vena cava, the thoracic aorta and the right innominate vein. This singular case was discussed at the thoracic tumour board. Considering the intimacy to major blood vessels, the lesion was deemed inoperable.

The patient was oriented towards medical oncology for combination chemotherapy with cisplatin, pemetrexed and bevacizumab.

DISCUSSION

Malignant pleural mesotheliomas appearing as a localized antero-superior mediastinal lesion are extremely infrequent. Only two cases have been described in the literature,^{2,3} none presenting with vocal cord paralysis. Our initial suspicion was a lymphadenopathy due to the location of the lesion, but its shape and the pattern of adjacent tissue invasion was unusual. A highly inflammatory lymphadenopathy (i.e., tuberculous adenitis) could have taken such an appearance, but the aggressive features of the lesion limited our subsequent differential diagnosis to lymphoma, germ cell tumours and thymic carcinoma.

Cytologic analyses proved to be of the utmost importance in this case. In MPM, thoracoscopic biopsies are the gold standard as thoracentesis and pleural fluid cytology analysis is diagnostic in less than 30% of cases.⁴ This is due to the intrinsic impossibility of demonstrating tumour invasion on cytologic samples. Three histologic types of MPM are defined: epithelioid (the most common), sarcomatoid or a combination of both, biphasic. Specific immunohistochemical markers are chosen according to the morphology of the tumour to guide the final diagnosis. As in our patient, calretinin, WT1, CK5/6 and D2-40 are some of the most widely used positive markers of epithelioid mesothelioma while keratin AE1/3 is more frequently used for sarcomatoid mesothelioma. The recent additions of markers such as Breast Cancer Associated Protein 1 (BAP1) and methylthioadenosine phosphorylase (MTAP) which are strongly associated with malignancy when their expression is lost in mesothelial cells, help further establish a diagnosis of mesothelioma. The loss of claudin 4 is another marker which helps confirm carcinomatous lineage. These new immunohistochemical markers have the potential to significantly increase the diagnostic sensitivity and specificity of cytology obtained by thoracentesis or fine needle aspiration. In our case, only claudin 4 was deemed necessary for diagnosis aside aforementioned positive mesothelial markers as mesothelial cells should not be found in the mediastinum.

When assessing an anterior mediastinal mass, a broad differential diagnosis must be considered. Thymus compartment mass, lymphoma, germ cell tumours, intrathoracic thyroid mass and parathyroid adenoma are most frequently encountered. In this case, despite not relying on a thoracoscopic biopsy, a thorough cytologic analysis of the specimen obtained by EBUS-TBNA with the use of novel immunohistochemical markers led to the appropriate diagnosis.

Albeit a rare finding, we suggest including mesothelioma in the extended differential diagnosis of an atypical mediastinal lesion with a pleural base.

AUTHOR CONTRIBUTIONS

Nicholas Quigley and Marc Fortin wrote the manuscript. Nicholas Quigley, Loic Lang-Lazdunski, Catherine Boily-Daoust, Christian Couture and Marc Fortin contributed into the design and reviewed the manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST

None declared.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ETHICS STATEMENT

The authors declare that appropriate written informed consent was obtained for the publication of this manuscript and accompanying images.

ORCID

Nicholas Quigley  <https://orcid.org/0000-0001-9177-7947>

Marc Fortin  <https://orcid.org/0000-0002-2399-2589>

REFERENCES

1. Scherpereel A, Opitz I, Berghmans T, Psallidas I, Glatzer M, Rigau D, et al. ERS/ESTS/EACTS/ESTRO guidelines for the management of malignant pleural mesothelioma. *Eur Respir J*. 2020;55(6):1900953. <https://doi.org/10.1183/13993003.00953-2019>
2. Hassan I, Goolam-Mahomed A. An unusual cause of an anterior mediastinal mass. *Respir Med Case Rep*. 2014;12:52–4. <https://doi.org/10.1016/j.rmcr.2013.12.004>
3. Hino T, Kamitani T, Sagiyama K, Yamasaki Y, Okamoto I, Tagawa T, et al. Localized malignant pleural mesothelioma mimicking an anterior mediastinal tumor. *Eur J Radiol Open*. 2019;6:72–7. <https://doi.org/10.1016/j.ejro.2019.01.006>
4. Husain AN, Colby TV, Ordóñez NG, Allen TC, Attanoos RL, Beasley MB, et al. Guidelines for pathologic diagnosis of malignant mesothelioma 2017 update of the consensus Statement from the international mesothelioma Interest group. *Arch Pathol Lab Med*. 2018; 142(1):89–108. <https://doi.org/10.5858/arpa.2017-0124-RA>

How to cite this article: Quigley N, Lang-Lazdunski L, Boily-Daoust C, Couture C, Fortin M. An unusual isolated anterior mediastinal lesion. *Respirology Case Reports*. 2022;10:e01059. <https://doi.org/10.1002/rcr2.1059>