

Spontaneous synchronous bilateral hemothorax as the only finding in primary pleural angiosarcoma: a case report and a literature review

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Abstract

Angiosarcoma is a rare malignancy of vascular origin, mostly originating from skin, soft tissues, and breast, but rarely also from the pleura. We present the case of a 55-year-old man who referred to our hospital for a spontaneous bilateral hemothorax. The CT

angiography did not show any source of active bleeding; plus, no pleural or lung masses were observable. Cytological and microbiological analyses made on a sample of pleural fluid resulted negative. Despite numerous blood transfusions and thoracenteses, the patient deceased from hemorrhagic shock ten days later and the diagnosis of primary pleural epithelioid angiosarcoma was obtained only by autopsy. Additionally, we present a review of the literature about primary pleural angiosarcomas.

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Introduction

Angiosarcoma (AS) is a rare malignancy of vascular origin, representing about 1% of all the soft tissues' sarcomas. It most often occurs in the skin, soft tissues, and breast. Its presentation and behavior differ depending on the location involved. ASs can be divided into four groups: cutaneous AS associated or unassociated with lymphedema, AS of the breast, and AS of deep soft tissue [1].

Pleurae can be affected by metastases or, rarely, as the first site of malignancy. Histologically, two variants are observable: the morphology of the pleural angiosarcoma can be spindle-shaped or can be of epithelioid type. In particular, the epithelioid type accounts for 75% of the pleural ASs and it is related to a worse prognosis [2]. We present the case of a 55-year-old Caucasian male affected by an extremely aggressive form of pleural epithelioid AS, which presented itself as spontaneous bilateral hemothorax without macroscopic or radiological pleural lesions.

Case Report

A 55-year-old Caucasian male was admitted to a local hospital because of dyspnea; he had no significant respiratory disease, but 16 months earlier he underwent a percutaneous transluminal coronary angioplasty with stent placement due to coronary artery disease; furthermore, no trauma was reported. Blood tests showed anemia (hemoglobin 8.6 g/dL) and leukocytosis. Electrocardiogram and echocardiogram showed no significant findings. At the chest X-ray bilateral pleural effusion was observed, confirmed by the subsequent CT-scan (Figure 1); the liquid had a density of 20-25 Hounsfield Units, consistent with blood. No pleural lesions, lymphadenopathies or metastases were observable. The patient was then transferred to our hospital in order to perform a CT angiography, which showed no active bleeding. Dual antiplatelet therapy (clopidogrel and acetyl-salicylic acid) was promptly

discontinued and antibiotic therapy with Azithromycin and Cefotaxime was started. A chest tube was placed in the left pleural space: 4 liters of hematic fluid (hemoglobin 7.0 g/dL) were drained, with partial regression of dyspnea. Cytological and microbiological analyses resulted negative. Multiple blood transfusions were performed, and tranexamic acid was administered. Six days later, clinical conditions severely deteriorated: a new CT showed increasing bilateral pleural effusion, yet no active bleeding and no lesions were observed (Figure 1). Again, no malignant cells were found at the cytological analysis. Given the rare nature of the disease, the case was thoroughly discussed both internally and on “Pleural Hub” [3], a Facebook group which connects many Italian physicians in order to discuss complex clinical cases, mainly about pleural pathology. Many hypotheses were done, especially about a malignant etiology of the hemothorax, such as hemangioendothelioma, primary or secondary AS or a hematologic malignancy. A surgical revision or a medical thoracoscopy were suggested, but the precarious conditions of the patient did not allow any invasive procedures.

Despite maximum efforts, the patient deceased two weeks after the admission and afterwards an autopsy was performed. No macroscopic masses were observed. The final diagnosis, obtained *via* histological examination of both pleurae, was a bilateral epithelioid pleural AS, with lung, thoracic nodal and pericardial metastases (Figure 2).

Discussion

Spontaneous hemothorax is a subcategory of hemothorax that involves the accumulation of blood within the pleural space in the absence of trauma or other causes. The clinical presentation is variable, including a rapid progression of symptoms (*e.g.*, dyspnea and chest pain) that can be life-threatening [4].

The primary treatment for AS, especially for localized lesions, is surgical resection. However, as it grows rapidly, very few cases can undergo surgery. Radiotherapy could play a beneficial role in the absence of diffuse lesions, while standard chemotherapy has few effects, and it is generally performed as a palliative treatment [2].

In our review of the literature, we found 34 cases of primary pleural ASs (Table 1). The average age at presentation is 65±12 years and males are affected more frequently (82%). To date, this is the only case in literature of a primary synchronous bilateral pleural AS with no macroscopic anatomical or radiological masses. In fact, in all the cases reviewed, pleural thickening or macroscopic pleural lesions or metastases are reported, as a suggestion to the diagnosis.

Conclusions

Since its clinical presentation is devious and its prognosis is often extremely poor, early recognition of this malignancy should be the most desirable target. It should always be suspected in the presence of spontaneous hemothorax, even if no lesions are observable at CT-scans. Unfortunately, performing biopsies is not always a feasible option. Few cases are reported in literature, and further studies and case reports are needed. Sharing these complex cases via simple online tools, such as Facebook groups like “Pleural Hub”, may expedite diagnosis, even though palliative treatment may be the only available option.

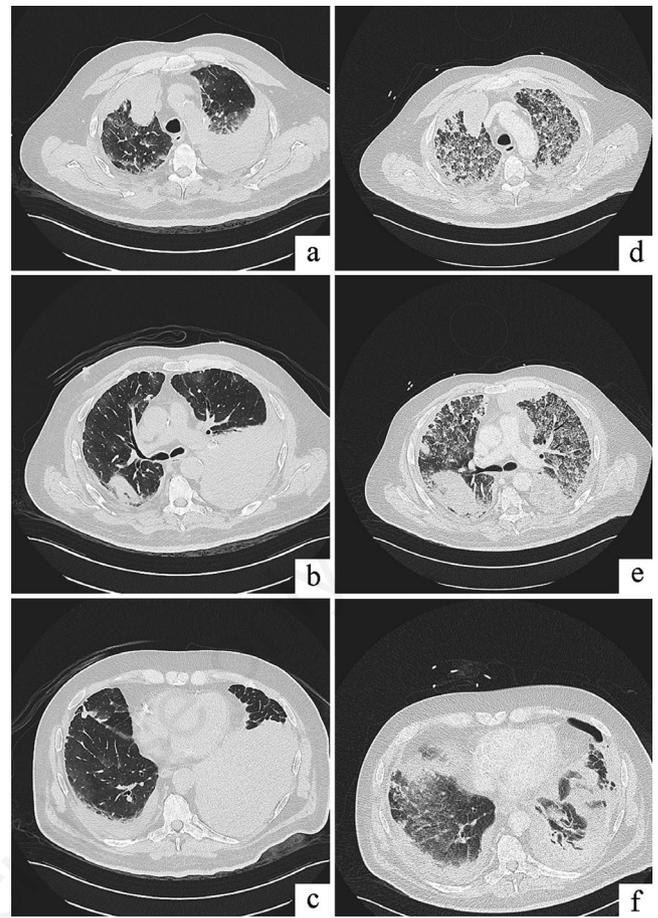


Figure 1. a,b,c) CT scan at the admission shows bilateral hematic pleural effusion and ground-glass alterations. d,e,f) CT scan performed after 6 days reveals increasing ground-glass alterations and bilateral pleural effusion, despite the chest tube.

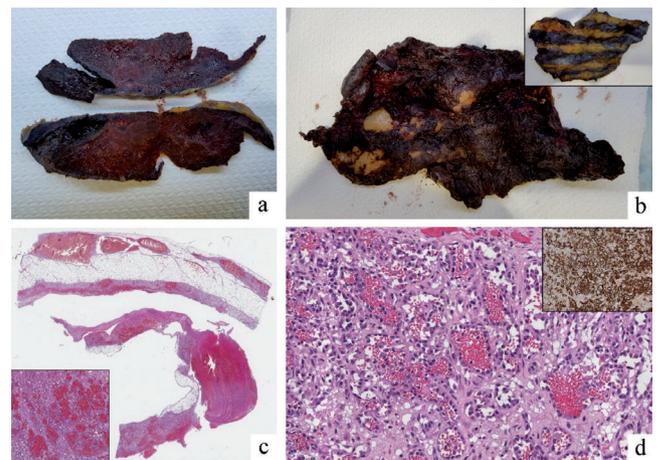


Figure 2. a) Severe hemorrhagic infarction of lung parenchyma with consolidated areas. The space between visceral and parietal pleura is filled with blood and fibrin. No space-forming masses are recognizable. b) Internal surface of parietal pleura with blood and fibrin stratification. External surface of parietal pleura (inset). c) Histological scan section of pathological parietal pleura; next to hemorrhagic areas, diffuse neoplastic proliferation with vascular forming architecture (inset). d) The neoplastic cells show epithelioid morphology. Diffuse positivity for vascular marker CD31 (inset).

Table 1. Angiosarcoma cases in the literature.

Author and Journal	Sex, age	Clinical presentation	Lesions at chest CT-scan	Thoracoscopy	Extra-thoracic metastases at diagnosis	Treatment
Azzakhmam <i>Pan Afr Med J</i> 2019 [2]	M, 70	Dyspnea, ascites	Right-sided pleural thickening, lymphadenopathy	Biopsies from the parietal pleura	No	No
Kubo <i>Respirol Case Rep</i> 2019 [5]	M, 82	Epigastric and right-sided chest pain	Pleural thickening, mass on the seventh rib	Not performed. CT-guided needle biopsy	Bones, liver	RT
Filippiadis <i>J Vasc Interv Radiol</i> 2018 [6]	M, 74	Right-sided hemorrhagic pleural effusion	Nodular paraspinal posterior chest wall mass	Not diagnostic	-	Surgery
Durani <i>Respir Med Case Rep</i> 2018 [7]	M, 62	Right-sided pleural effusion	Ground-glass pulmonary nodules	Areas of nodularity	Bones	No
Cabibi <i>Diagn Pathol</i> 20178 [8]	M, 50	Dyspnea, left-sided pleural effusion	Circumferential pleural thickening with pleural masses	Not performed. VATS biopsy	No	No
Miller <i>Am J Respir Crit Care Med</i> 2017 [9]	M, 75	Dyspnea and left-sided pleural effusion	FDG-avid areas at the PET-CT	Pleural mass	No	CTX
Yamaguchi <i>J Dermatol</i> 2017 [10]	F, 72	Left-sided pleural effusion	Pleural mass	Biopsy	Skin	CTX, RT
Patel <i>Chest</i> 2016 [11]	M, 72	Spontaneous pneumothorax	Not mentioned	Not performed. VATS biopsy	No	CTX
Panjwani <i>Egypt J Inter Med</i> 2016 [12]	M, 76	Right sided chest pain, cough, dyspnea	Nodular pleural thickening and pleural effusion	Not performed. VATS biopsy	No	Surgery
Matsuda <i>Pathol Int</i> 2015 [13]	M, 87	Anemia	Nodular mass on the right pleura	Not performed	-	-
Zhang <i>Int J Clin Exp Pathol</i> 2015 [14]	M, 76	Cough	Left pleural mass, pleural thickening	Not performed	No	Surgery
Onur <i>J Pak Med Assoc</i> 2013 [15]	F, 79	Dyspnea	Cystic and cavitory lesions, left pleural thickening	Not performed	No	No
Quesada <i>Ann Clin Lab Sci</i> 2013 [16]	F, 58	Dyspnea, fever	Pleural nodules	Not performed. VATS biopsy	-	CTX
Abu-Zaid <i>Case Rep Pulmonol</i> 2013 [17]	M, 63	Chest pain, dyspnea, and hemoptysis	Right lung thickening and calcifications, diaphragmatic pleural masses	Not performed. CT-guided needle-core biopsy	No	Surgery
Chen <i>Interact Cardiovasc Thorac Surg</i> 2013[18]	M, 69	Chest pain and body weight loss	Pleural hematomas	Lesions on the lower pleural cavity	No	No
Tsubouchi <i>J Thorac Oncol</i> 2012 [19]	M, 72	Dyspnea	Left pleural mass	Not performed. Ultrasound-guided biopsy	Skin, lung	CTX
Lorentziadis <i>Ann Thorac Surg</i> 2012 [20]	M, 77	Dyspnea	Pleural thickening	Not diagnostic	-	Surgery
Kao <i>Diagn Pathol</i> 2011 [21]	M, 49	Chest pain, dyspnea	Pleural thickening	Blood clots and right pleural thickening	-	Surgery, CTX, RT

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Table 1. Continued from previous page.

Author and Journal	Sex, age	Clinical presentation	Lesions at chest CT-scan	Thoracoscopy	Extra-thoracic metastases at diagnosis	Treatment	
Otsubo <i>Nihon Hinyokika Gakkai Zasshi</i> 2011 [22]	M, 79	Hematuria, anemia	No	Not performed	Adrenal glands, bones, stomach, urinary bladder	No	
Miyazaki <i>Hum Pathol</i> 2011 [23]	M, 68	Hoarseness	Capsulated left pleural mass	Not performed. CT-guided needle biopsy not diagnostic	Right lung	-	
Baisi <i>Interact Cardiovasc Thorac Surg</i> 2011 [24]	M, 75	Left-sided chest pain	Pleural thickening, pleural masses	Multiple blood-filled cysts	-	Surgery, CTX	
Dainese <i>Pathol Res Pract</i> 2010 [25]	M, 62	Dyspnea, bilateral hemothorax	No	Pleural fibrin coating, lung consolidation	No	No	
Saitou <i>Kekkaku</i> 2009 [26]	M, 76	Cough, chest pain and dyspnea	Soft tissue mass, pleural calcifications	Not performed. CT- and US-guided biopsies not diagnostic	Bones	No	
Kurtz <i>Sarcoma</i> 2004 [27]	M, 61	Massive bilateral hemothorax	No	Multiple pleural septa	Skin, oral mucosa	-	
Chen <i>Arch Pathol Lab Med</i> 2004 [28]	M, 39	Right-sided chest pain, dyspnea, cough	Pleural thickening, right-sided mass	Not performed	No	Surgery, CTX	
Pramesh <i>Ann Thorac Cardiovasc Surg</i> 2004 [29]	M, 55	Chest pain, cough, hemoptysis	Right-sided mass with calcifications	Not performed	-	Surgery	
Kimura <i>Pathol Int</i> 2003 [30]	M, 70	Intermittent episodes of memory loss, headache	Mass in the left parietal lobe of the brain, right-sided thoracic mass	Not performed	Brain	No	
Roh <i>J Korean Med Sci</i> 2001 [31]	F, 34	Dyspnea, chest pain	Pleural thickening	Not performed	No	Surgery, CTX	
Zhang <i>Hum Pathol</i> 2000 [32]	M, 53 F, 62 M, 66 M, 45 M, 60	Pleural effusion Pleural effusion, ascites Pleural effusion Recurrent pleural effusion Bloody pleural effusion	Pleural thickening Pleural thickening Pleural thickening	Not mentioned Pleural thickening Not mentioned Pleural thickening Pleural thickening	- Not mentioned - Not mentioned Not mentioned	- - - - -	- Surgery - - -
Alexiou <i>Eur J Cardiothorac Surg</i> 1998 [33]	F, 57	Massive bilateral hemothorax	Pleural bilateral masses	Not performed	No	Surgery, RT	

CT, computed tomography; RT, radiotherapy; VATS, video-assisted thoracic surgery; FDG, fluorodeoxyglucose; PET/CT, positron emission tomography/computed tomography; CTX, chemotherapy; US, ultrasound.

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