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## CASE SERIES

# Spontaneous pneumothorax revealing pulmonary metastases: A Case Study

## *Pneumothorax spontané révélant des métastases pulmonaires: Une étude de cas*

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### ABSTRACT

Spontaneous pneumothorax is a common pulmonary pathology. It usually occurs in patients with underlying pulmonary pathology. Spontaneous pneumothorax related to primary or metastatic malignancy is rare. The pathophysiological mechanism by which pneumothorax occurs in lung cancer is not yet well elucidated, and numerous hypotheses have been reported in the literature. Our study focuses on two cases of spontaneous pneumothorax revealing pulmonary metastases, hospitalized in the Pneumology Department of Arrazi Hospital, CHU Mohammed VI Marrakech.

**KEYWORDS:** Pulmonary Metastases; Spontaneous Pneumothorax; Lung Cancer.

### RÉSUMÉ

Le pneumothorax spontané est une pathologie pulmonaire courante. Elle survient généralement chez des patients présentant une pathologie pulmonaire sous-jacente. Le pneumothorax spontané associé à une tumeur maligne primitive ou métastatique est rare. Le mécanisme physiopathologique par lequel le pneumothorax survient dans le cancer du poumon n'est pas encore bien élucidé et de nombreuses hypothèses ont été rapportées dans la littérature. Notre étude porte sur deux cas de pneumothorax spontané révélant des métastases pulmonaires, hospitalisés au Service de Pneumologie de l'Hôpital Arrazi, CHU Mohammed VI Marrakech.

**MOTS CLÉS:** Métastases pulmonaires; pneumothorax spontané; cancer du poumon..

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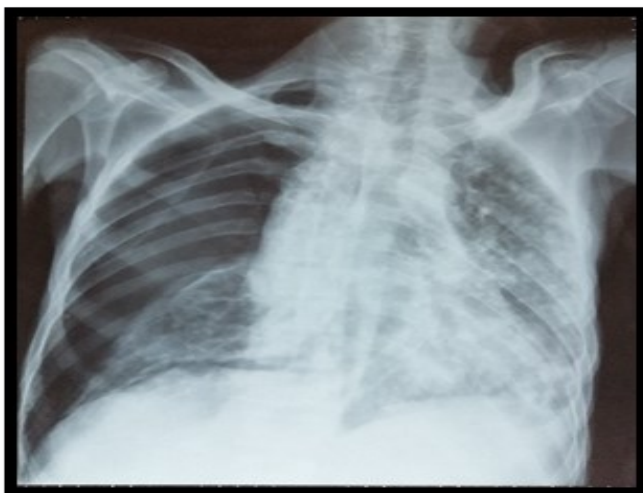
## INTRODUCTION

Spontaneous pneumothorax is a very common lung condition, usually occurring in patients with underlying pulmonary pathology such as emphysema or infectious origin (tuberculosis or ruptured hydatid cyst), but its relationship with benign or malignant, primary or metastatic tumor pathology is extremely rare, however it should be evoked in any patient with a history or risk factor of neoplastic pathology. We report two cases of spontaneous pneumothorax, revealing pulmonary metastases.

## OBSERVATION

### Clinical case 1.

This is a 55-year-old patient who had been treated in urology for 3 months for a tumoral process of the right kidney complicated by thrombosis of the inferior vena cava and thrombosis of the right renal vein and who was put on anticoagulant therapy (antivitamin K), who presented with right-sided stabbing chest pain

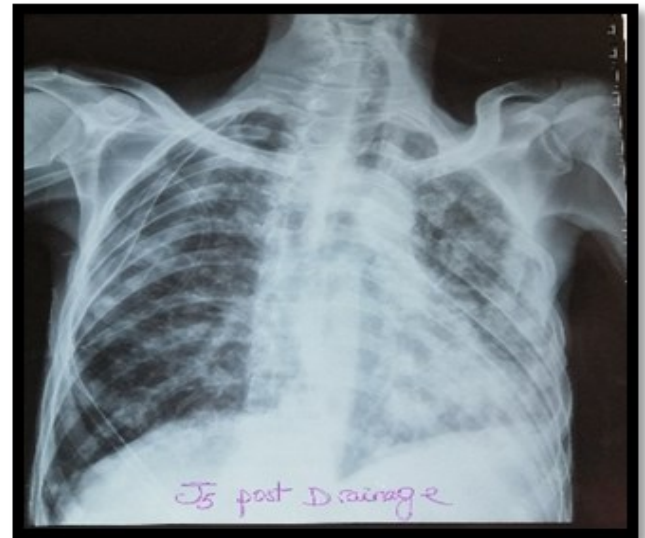


**FIGURE 1.** Chest X-ray showing a large right pneumothorax.

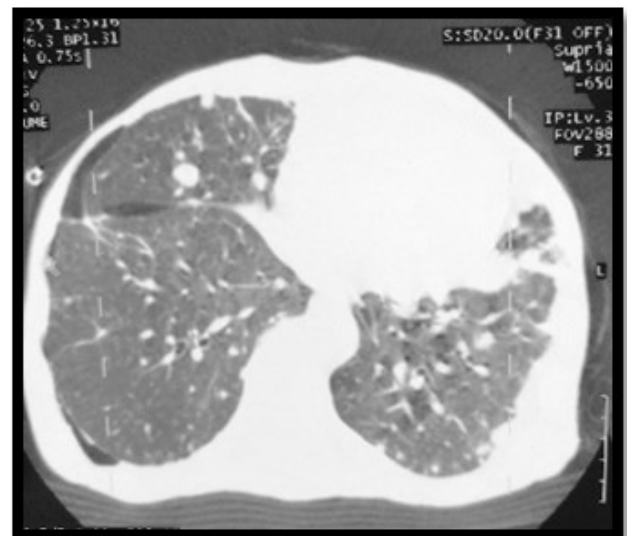
associated with Sadoul stage IV dyspnea. A chest X-ray was performed, revealing a right-sided pneumothorax of great abundance with a left interstitial syndrome (Figure 1).

Clinical examination on admission revealed a patient with a performance status index of 4, presenting with right airway effusion syndrome. Left thoracic drainage was performed, allowing the lung to return to the wall after 6 days. On the post-drainage chest X-ray (Figure 2), we noted a diffuse bilateral interstitial syndrome with diffuse nodular opacities. A thoracic CT scan (Figure 3) revealed multiple intraparenchymal and subpleural nodules and micronodules scattered over the 2 hemi-lung fields, creating a balloon-like appearance with secondary mediastinal adenopathy. Extension work-up revealed metastatic lesions in the bone and liver, with an enormous right renal tumor process

responsible for vascular invasion. The patient died two days before confirmation of the diagnosis.



**FIGURE 2.** Post-drainage X-ray showing bilateral diffuse nodular and micronodular opacities in place.



**FIGURE 3.** Multiple intraparenchymal and subpleural nodules are scattered over the two hemifields, creating a balloon-like appearance.

### Clinical case 2

A 63-year-old patient with no specific pathological history was admitted to our clinic with abrupt onset, moderate-intensity left basithoracic stabbing pain, exacerbated by deep inspiration and coughing, associated with Sadoul stage III dyspnoea without orthopnoea, and a dry cough. A clinical examination revealed a left air pleural effusion syndrome. A chest X-ray was ordered, showing a left total pneumothorax of great abundance with deviation of mediastinal elements to the contralateral side, associated with bilateral roughly rounded intraparenchymal opacities producing a balloon-like appearance and right apical reticulo-nodular infiltrates

(Figure 5). The patient was drained, with the lung returning to the wall on the post-drainage radiograph. We completed a thoraco-abdominopelvic CT scan, revealing a glottic lesion of the right vocal fold of stenosing appearance associated with peripheral pulmonary nodular formations of secondary appearance (Figure 6).



FIGURE 5. Chest X-ray showing a left pneumothorax associated with bilateral balloon release opacities.

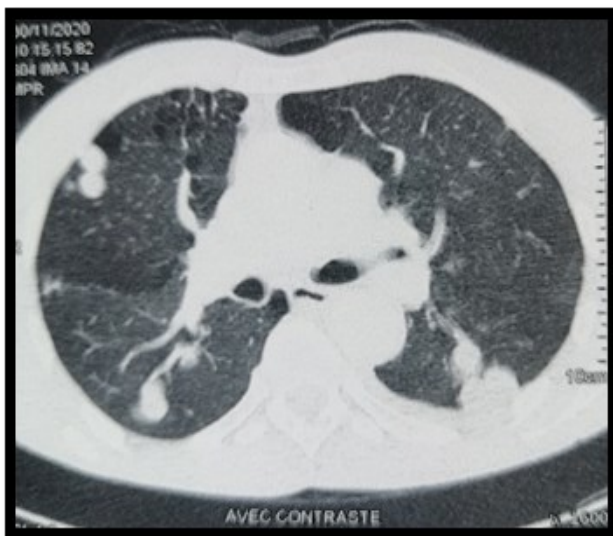


FIGURE 6. Chest CT shows peripheral pulmonary nodular formations of secondary appearance

## DISCUSSION

Spontaneous pneumothorax can be divided into two categories: primary and secondary. Primary SP most often affects young, healthy individuals. The secondary type may develop with obstruction, infection, infarction, neoplasm, or diffuse lung disease. PS as a complication of lung, metastases or primary lung carcinoma is rare, with cancer found in only 0.5–3% of pneumothoraces [1, 2]. These are most often pulmonary metastases of extra-thoracic tumors, less

frequently primary bronchial cancers, and occasionally pulmonary localizations of hematological malignancies [3]. The most common primary tumors to produce excavated metastases, and therefore PS, are those derived from epithelial tissue, genital tumors, and sarcomas [4].

Multiple mechanisms have been proposed [5, 6]:

1/ Formation of a fistula between the parenchyma and pleura due to necrosis of a subpleural tumor nodule, secondary to vascular injury or chemotherapy.

2/ Partial bronchial obstruction by a tumor, with alveolar distension and passage of air through the alveolar spaces, then through the inter-lobular septa to the pleura, forming blebs which may rupture.

3/ Tumor embolism with infarction and necrosis.

4/ Tumor infiltration of the wall of a pre-existing benign cavity and rupture into the pleural space.

In a 1973 Mayo clinical study of 1143 patients with spontaneous pneumothorax, only ten were attributed to pulmonary malignancy, these pneumothoraces occurred before suspicious nodules were identified on chest X-ray [9]. In the literature, a dozen cases of spontaneous pneumothorax associated with cystic images have been described; with no evidence of pulmonary metastases in the initial radiological work-up, since then, this study and the introduction of computed tomography (CT) have had their importance. In the Mayo series, all five metastatic lung tumors were sarcomas; similarly, in the cases reported by Sherman and Brant, six of the seven tumors were sarcomas and one was a metastatic adenocarcinoma.

Treatment of pneumothorax usually consists of thoracic drainage. Chemical pleurodesis is indicated to prevent recurrence. Surgery should be avoided in these patients, given the anaesthetic risk and technical difficulties involved [7,8].

## CONCLUSION

Spontaneous pneumothorax secondary to tumor pathology is rarely observed. Pneumothorax may be the first sign of metastasis or lung cancer. The mechanisms by which pneumothorax occurs in lung cancer are unclear, leading to different points of view. Tumor origin should always be considered as a possible cause of PS in elderly patients or heavy smokers.

## CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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