

## LETTERS TO THE EDITOR

### Pheochromocytoma as a Cause of Massive Hemoptysis

**To the Editor:** Diffuse alveolar hemorrhage is a syndrome characterized by hemoptysis, dyspnea, low hemoglobin levels, hypoxemia, and the appearance of alveolar infiltrates in the x-ray.<sup>1</sup> Other clinical signs include chest pain, fever, and cough. The causes are numerous (infections, external agents, neoplasms, autoimmune diseases, coagulopathy, valvular disease, pulmonary hypertension, and idiopathic pulmonary hemosiderosis). Pheochromocytoma is a neoplasm that can produce hemoptysis as a consequence of pulmonary metastasis. However, diffuse alveolar hemorrhage rarely occurs as a complication of a hypertensive crisis in patients with this neoplasm. We report a case of diffuse alveolar hemorrhage as a consequence of a hypertensive crisis secondary to pheochromocytoma.

A 72-year-old man came to our hospital complaining of dyspnea. His medical history included ischemic heart disease and an episode of interstitial pneumonitis and respiratory insufficiency, which responded to corticosteroid therapy. Since then, he had remained asymptomatic. The complement of tests performed on admission revealed slight renal insufficiency (urea, 67 mg/dL; creatinine, 1.3 mg/dL), microcytic anemia (hemoglobin levels of 7.1 g/dL; mean corpuscular volume of 73 fL), and a chest x-ray showed interstitial opacities radiating from the hilum. Physical examination was normal, except for crepitations heard over the middle lung fields posteriorly. Bronchoscopy revealed active bleeding in the left lung (both lobes) and clots in the right bronchial tree. Cytology of bronchoalveolar lavage fluid established a diagnosis of alveolar hemorrhage, with 65% macrophages and a positive Perls' stain. Accordingly, we began considering diffuse alveolar hemorrhage. Both the autoimmune workup and the sputum smear were negative. Echocardiography ruled out significant valvular disease and the abdominal ultrasound revealed a nonuniform hypoechoic mass measuring 28 × 24 mm between the vena cava and the right kidney, indicating adrenal adenoma.

After admission, the patient deteriorated rapidly, experiencing labored breathing, blood pressure levels over 260/290/100 mm Hg, and severe hemoptysis. He was transferred to the intensive care unit, where he required intubation and mechanical ventilation.

The chest x-ray showed a diffuse pattern of airspace consolidation (Figure), indicative of pulmonary hemorrhage. Concentrations of catecholamines in urine and plasma were diagnostic of pheochromocytoma. Surgery could not be performed with the patient in critical condition and he died. The autopsy revealed a right suprarenal pheochromocytoma, pulmonary fibrosis, bilateral alveolar hemorrhage without capillaritis, and signs of pulmonary arterial hypertension.

The classic clinical triad of pheochromocytoma consists of episodes of headache, sweating, and tachycardia, but the form of presentation can vary widely. Although the association between pheochromocytoma and hemoptysis has been described before this, most cases have been due to lung metastasis of the tumor. Only 5 cases in which hemorrhage was secondary to hypertensive crises caused by the pheochromocytoma are reported in the literature.<sup>2-6</sup>

The mechanism that generates diffuse alveolar hemorrhage in patients with hypertensive crises secondary to pheochromocytoma has not been clearly established. However, a rapid rise in blood pressure to extreme levels can cause pulmonary hypertension in the vascular tree, resulting in capillary rupture and the passing of blood cells into the alveolar space. Coagulation disorder has also been described in 2 of the 5 published cases of association between pheochromocytoma and hemoptysis, although further studies are required to shed light on how coagulation factors respond to catecholamines.

Although rare, pheochromocytoma should be included among the possible causes of diffuse alveolar hemorrhage, especially as specific curative treatment is available.

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1. Milman N, Pedersen FM. Idiopathic pulmonary haemosiderosis. Epidemiology, pathogenic aspects and diagnosis. *Respir Med.* 1998;92:902-7.

2. Frymoyer PA, Anderson GH Jr, Blair DC. Hemoptysis as a presenting symptom of pheochromocytoma. *J Clin Hypertens.* 1986; 2:65-7.
3. Colas JL. Paroxysmal hypertension with haemoptysis due to a retroperitoneal paraganglioma. *East Afr Med J.* 1965;42:535-40.
4. Iino S, Nagashima N, Akiba H, Ban Ymiyamoto M. Hemoptysis and palpitation (with hypertension): pheochromocytoma. *Nippon Rinsho.* 1975;Spec No:918-9:1394-5.
5. Bourvis N, Fartoukh M, Christin-Maitre S, Francois T, Parrot A, Mayaud C. Intraalveolar hemorrhage revealing pheochromocytoma. *Rev Pneumol Clin.* 2006;62: 43-8.
6. Kimura Y, Ozawa H, Igarashi M, Iwamoto T, Nishiya K, Urano T, et al. A pheochromocytoma causing limited coagulopathy with hemoptysis. *Tokai J Exp Clin Med.* 2005;30:35-9.



**Figure.** Anteroposterior chest x-ray, taken after the patient was admitted to the intensive care unit, showing bilateral consolidation of the alveolar airspace radiating from the hilum, particularly in the upper lobes.