Case Report

Pulmonary capillary hemangiomatosis. A rare cause of pulmonary hypertension. The first Brazilian case*

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ABSTRACT

Pulmonary capillary hemangiomatosis is a rare disorder characterized by a proliferation of capillaries that invade the pulmonary interstitium and alveolar septae. Herein, we report the first Brazilian case of pulmonary capillary hemangiomatosis. A 21-year-old man presented with severe pulmonary hypertension that eventually resulted in his death. Upon admission, a computed tomography scan of the chest revealed diffuse ill-defined bilateral pulmonary nodules. A postmortem lung biopsy revealed pronounced multifocal proliferation of capillaries in the alveolar walls, interlobular septa and peribronchial connective tissue. A diagnosis of pulmonary capillary hemangiomatosis should be considered in patients presenting pulmonary hypertension and suspicious changes on high-resolution computed tomography scans.

Keywords: Hemangioma, capillary/etiology; Hemangioma capillary/diagnosis; Hypertension, pulmonary/complications; Tomography, Emission-Computed; Case report

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INTRODUCTION

Pulmonary capillary hemangiomatosis (PCH) is a rare disorder primarily characterized by conspicuous proliferation of capillaries in the pulmonary interstitium and alveolar septa.[1] It occurs in both males and females in the 12- to 71-year-old age bracket, and, in all, only 31 cases have been described in the international literature. In this report, we present the first Brazilian case of severe pulmonary hypertension secondary to PCH, together with a review of the pathogenic, diagnostic and therapeutic aspects involved.

CASE REPORT

A 21-year-old male, who was a professional driver and was living in the town of Viçosa (a rural area) in the state of Ceará, sought medical attention complaining of progressive dyspnea upon exertion for over a year, with isolated episodes of hemoptysis.

Fifteen days prior to hospitalization, cardiac catheterization revealed pulmonary hypertension and a pulmonary artery systolic pressure of 56 mmHg. Physical examination revealed dyspnea (+/4+) and hyperphonesis of the second heart sound in pulmonary focus. The patient denied any history of or current tuberculosis, asthma, smoking and illicit drug abuse.

Blood count, as well as assessment of liver and renal function, was normal. Arterial blood gas analysis in room air showed: a pH of 7.44; $PaCO_2$ of 31; PaO_2 of 67; SaO_2 of 93%; and HCO_3 of 20. Parasitological feces exams, as well as tests for antinuclear factor, lupus anticoagulant, anticardiolipin and human immunodeficiency antivirus, were negative. Serial acid-fast bacilli tests in induced sputum were negative.

An electrocardiogram showed signs of right ventricular overload. An echocardiogram revealed an ejection fraction of 79%, dilation of the right heart chambers, moderate tricuspid insufficiency and mean pulmonary artery pressure of 56 mmHg. Due to a worsening of symptoms, a second pulmonary arteriography was performed and showed that, in the pulmonary artery, systolic pressure was 80 mmHg, diastolic pressure was 42 mmHg, and mean pressure was 55 mmHg. In addition, pressures were elevated in the right heart chambers.

Spirometry, Doppler ultrasound of the abdomen and a rectal biopsy for schistosomiasis were performed. The results of all three were normal. The initial chest X-ray was considered normal (Figure 1A). However, a high-resolution computed tomography scan revealed a diffuse ground-glass pattern with small, ill-defined bilateral nodular opacities (Figure 2).

The patient presented worsening of symptoms with evident respiratory insufficiency, increased pulmonary artery pressure (pulmonary artery systolic pressure of 90 mmHg) and radiological worsening (Figure 1B). The patient was transferred to an intensive care unit and received pulse therapy with methylprednisolone (1 g/3 days), with no efficacious clinical response. He was also submitted to invasive mechanical ventilation, but there was no improvement in hypoxemia, and he died.

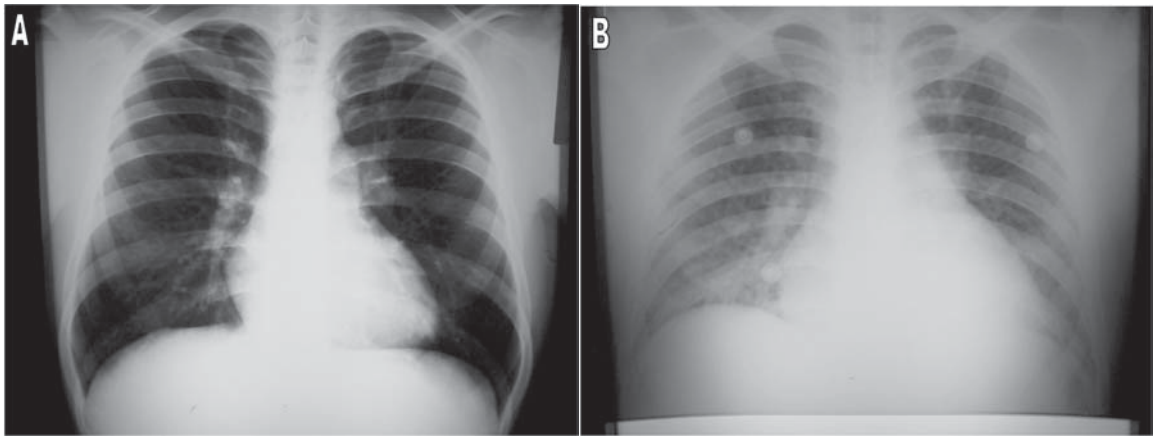

Figure 1 - A) Initial chest X-ray apparently normal; B) Chest X-ray upon admission to ICU, showing signs of congestion and pulmonary hypertension

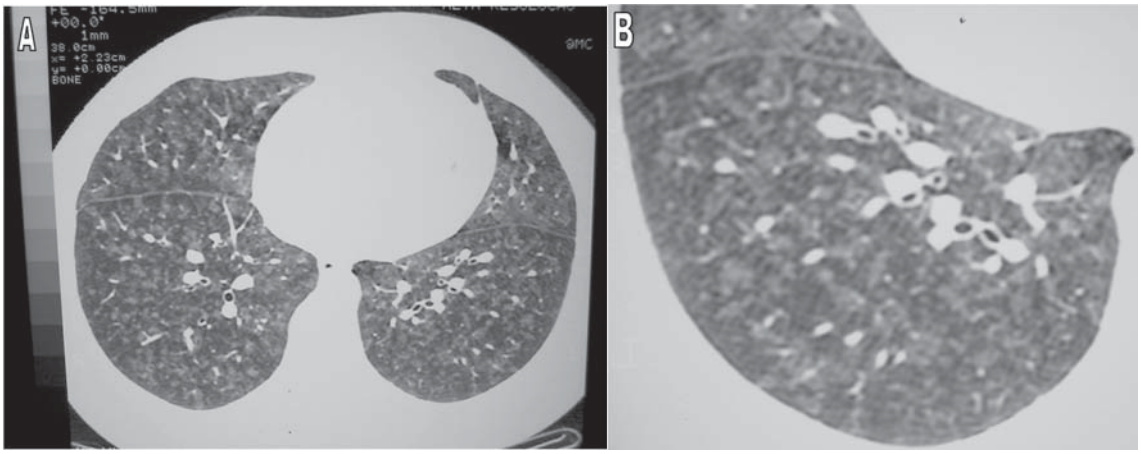

Figure 2 - A and B) High-resolution computed tomography scan showing small, ill-defined bilateral nodular opacities and a diffuse ground-glass pattern

A postmortem lung biopsy revealed pronounced multifocal proliferation of capillaries in the alveolar walls, interlobular septa and peribronchial connective tissue, as well as in the pleura. We observed hemosiderosis, together with slight medial thickening of the pulmonary arteries, as well as thickening of the tunica intima of venules and small veins (Figure 3). Tissues with slight septal fibrosis and sparse leukocytes were found. These findings are consistent with a diagnosis of PCH.[3-9]

DISCUSSION

Since PCH is a rare cause of pulmonary hypertension, only 31 cases have been reported in the literature. This is, therefore, documented case number 32. The disease is not gender-specific[3-8] and mainly affects young adults, although individuals from 6 to 71 years of age may be affected.

The etiology of PCH is unknown, although, it has been suggested that it is related to the use of oral contraceptives or to a family component.[8-11] There is also evidence that it may result from a neoplastic capillary proliferation or be consequent to a prior infection.[12-15]

The clinical manifestations of PCH include dyspnea, hemoptysis and, in more severe cases, pulmonary hypertension. In pulmonary function tests (spirometry), nonspecific findings of volume restriction, airflow obstruction and decreased diffusing capacity for carbon monoxide are typically seen.[15]

The most typical radiographic findings are micronodules, diffuse reticulonodular infiltrates and increased caliber of the pulmonary artery. High-resolution computed tomography scans of the chest reveal enlargement of the pulmonary artery and a diffuse ground-glass pattern with small, ill-defined bilateral nodules.[15-17]

Histopathological examination reveals: multifocal proliferation of capillaries in the alveolar walls and interlobular septa, as well as in the peribronchial and pleural connective tissue; hypertrophy of the musculature of the pulmonary arterioles; thickening of the tunica intima of venules; and hemosiderosis.[17-18] A differential diagnosis of pulmonary veno-occlusive disease which presents thrombosis and fibrosis, thereby obliterating venules and leading to pulmonary congestion, should be considered.[19-20] In some cases of pulmonary veno-occlusive disease, PCH foci may be seen. The opposite may also occur, although when foci of pulmonary veno-occlusive disease are found in cases of PCH, they are not of the disseminated variety. In certain cases, this makes it difficult to distinguish PCH from pulmonary veno-occlusive disease. Making this distinction is dependent on determining the dominant characteristic. Pulmonary congestion may lead to alveolar capillary permeability, creating the illusion of PCH. However, in such cases, there is no quantitative increase in capillary size.[9]

Attempts at treatment with steroids and cyclosporine have been unsuccessful. Other reported approaches include treatment with alpha-interferon,[17] pneumonectomy (in the unilateral form of the disease)[10] and lung transplant. [18]

In this case, we initially considered testing

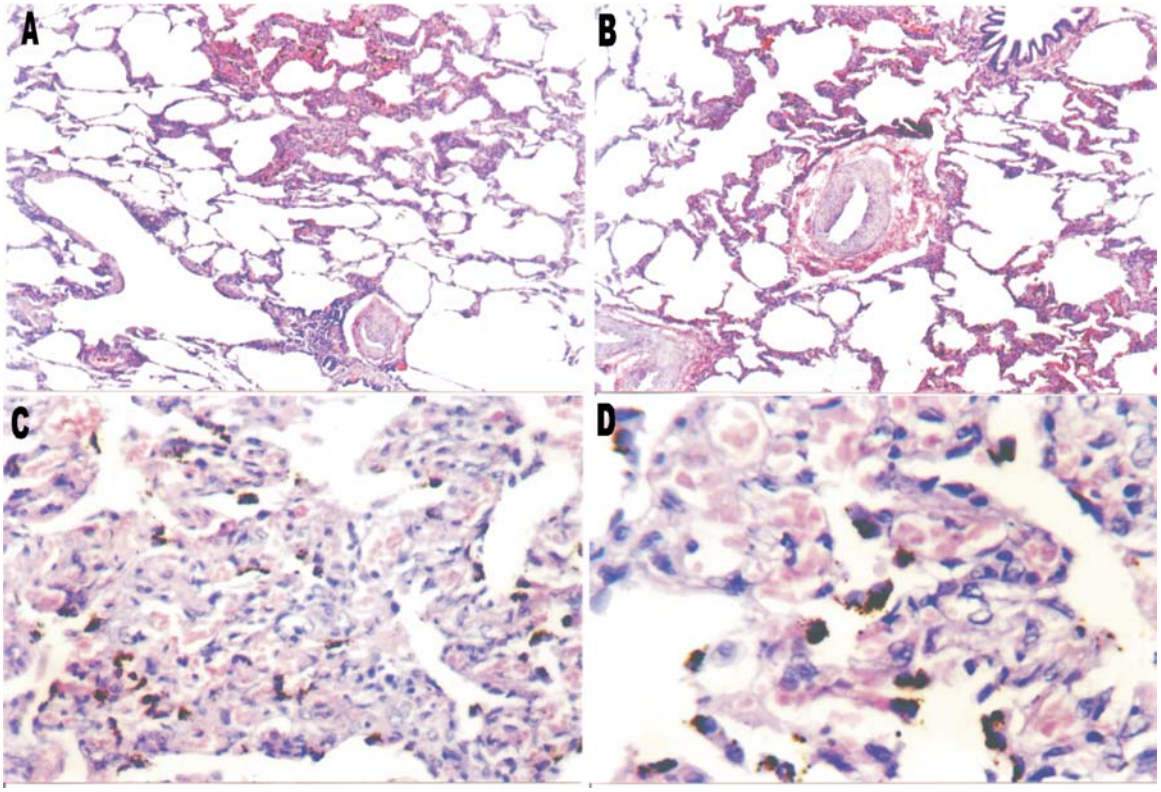

Figure 3 - Thickening of alveolar septa and peribronchial connective tissue by proliferation of congested capillaries (A and B, H&E-100x), hemosiderosis and proliferation of capillaries in the septa (C and D, H&E-400x)

vasodilation with nitric oxide, optimizing the levels of pulmonary artery pressure with the use of vasodilators and subsequently performing an open lung biopsy. However, this option was ruled out because the use of vasodilators in clinical suspicion of PCH may increase the risk of acute pulmonary edema during the procedure.[13]

Satisfactory therapeutic responses have been reported in only two cases documented in the literature. The first with the use of alpha-interferon, without relapse within five years, and the second with the use of doxycycline.[2] In the latter, the patient presented with an atypical manifestation of endotheliosis and did not initially respond to treatment with alpha-interferon. The response was followed by assessment of fibroblast growth factor levels in urine, this being the best indicator of therapeutic response in the cases already documented in the literature.

The PCH prognosis is generally poor, and, without treatment, the survival is less than two years after diagnosis.[1-18]

Since this pathology is rare, we were able to determine with certainty that this is the first case to be published in the indexed medical Brazilian literature. For the early diagnosis of new cases, it is important to consider PCH in the differential diagnosis of pulmonary hypertension.

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