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CASE

Massive hemoptysis following Rasmussen's aneurysm. A case report.

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ABSTRACT

Rasmussen's aneurysm (RA) is a pseudoaneurysm of a pulmonary artery (AP), adjacent to or within a tuberculous cavity, appearing in 5% of these lesions. Its rupture might provoke massive hemoptysis (MH) with a near 50% mortality. The aim of this article is to report a case of massive hemoptysis following Rasmussen's aneurysm. 52-year-old man with recent history of hospitalization due to pneumonia associated to influenza A and decompensated hyperthyroidism, presents outpatient chest radiograph with signs of hyperinflation and scarring apical opacities, the patient returned to the hospital due to sharp pain of left hemi thorax during inspiration accompanied with bloody sputum, asthenia and non-quantified weight loss. He evolves to frank MH, requiring endotracheal intubation managed in the intensive care unit (ICU). Chest computed tomography (CT) reported ground-glass opacity, nodules with a tendency to cavitation, tree-in-bud pattern in agreement with inflammation and infection, active TB is considered, and truncus of PA with vascular lesion suggestive of aneurysm dependent on pulmonary circulation, possibly RA. Fibrobronchoscopy reported signs of old and recent bleeding of left bronchial tree, probably of the lingula, blood clots in right bronchial tree. Molecular study and TB cultures was negative. Endovascular procedure with arteriography was carried out, revealing amputation of left distal segmental PA carrying the pseudoaneurysm with complete regression, discarding embolization RA It must be considered among the differential diagnoses of MH, especially on patients with pulmonary TB complications, such as the reported case. Due to its associated increased mortality, once RA is identified, it must be either endovascularly or surgically eradicated.

Keywords: *Rasmussen's aneurysm, hemoptysis, tuberculosis.*

INTRODUCTION

Rasmussen's aneurysm *(RA)* has been described as an infrequent complication of pulmonary tuberculosis *(TB)*. It represents a pseudoaneurysm of a pulmonary artery *(AP)*, adjacent to or within a tuberculous cavity, appearing in 5% of these lesions. Its rupture might provoke massive hemoptysis *(MH)* with a near 50% mortality *(Corr, 2011; Sapra, 2015)*.

RA's physiopathology corresponds to a chronic inflammation of the PA wall associated with a tuberculous cavity, thus replacing the tunica adventitia with granulation tissue and fibrinogen, with progressive wall thinning that evolves into the eponymous aneurysm *(Sapra, 2015)*. It is clinically manifested as recurrent hemoptyses of various degrees, being massive in 8% of the cases *(Sevilha et al., 2018)*.

The aim of this article is to report a case of massive hemoptysis following Rasmussen's aneurysm.

CASE PRESENTATION

52-year-old man, with Graves' disease undergoing irregular treatment with Methimazole and Propranolol, without further pathologies or surgical records, with recent history of hospitalization due to pneumonia associated to influenza A and

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decompensated hyperthyroidism, presents outpatient chest radiograph with signs of hyperinflation and scarring apical opacities, possibly TB-associated *(Figure 1)*.

The patient returned to the hospital due to sharp pain of left hemi thorax during inspiration accompanied with bloody sputum, asthenia and non-quantified weight loss. He evolves to frank MH, requiring endotracheal intubation managed in the intensive care unit *(ICU)*, achieving hemodynamic stability.

Chest computed tomography *(CT)* scan was performed, which reported *(Figure 2)*: ground-glass opacity, nodules with a tendency to cavitation, tree-in-bud pattern in agreement with inflammation and infection, active TB is considered. Truncus of PA with vascular lesion suggestive of aneurysm dependent on pulmonary circulation, possibly RA.

Fibrobronchoscopy *(FBC)* was performed, reporting signs of old and recent bleeding of left bronchial tree, probably of the lingula, blood clots in right bronchial tree *(Figure 3)*.

Molecular study *(GeneXpert MTb/RIF™)* and TB cultures were performed, resulting negative. Endovascular procedure with arteriography was carried out, revealing amputation of left distal segmental PA carrying the pseudoaneurysm with complete regression, discarding embolization *(Figure 4)*.

The patient evolved positively without new episodes of hemoptysis. Considering increased suspicion of untreated TB, eradication therapy was initiated.

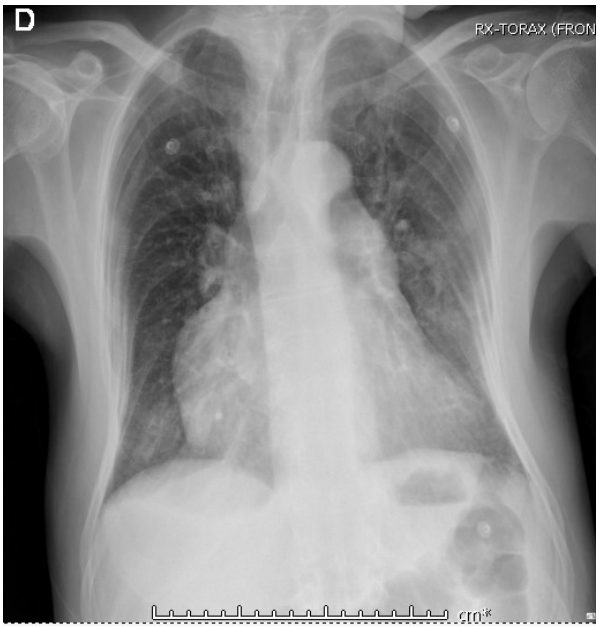

Figure 1. Chest radiograph. Signs of hyperinflation, lung parenchymal scarring, possibly TB-associated.

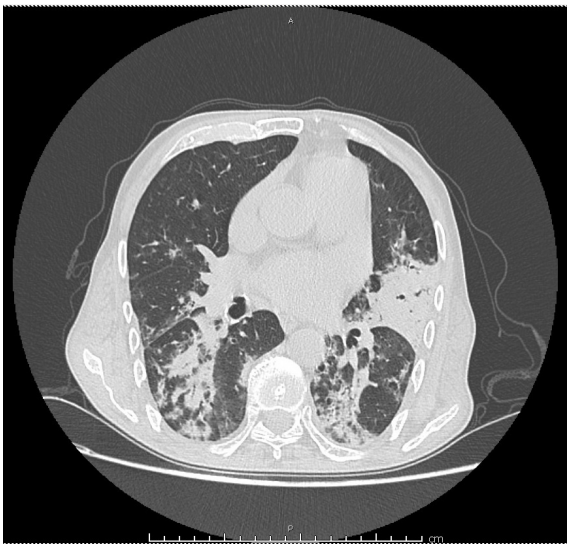

Figure 2. Chest CT scan: condensation areas of air space, ground-glass opacities, cavitated nodules and tree-in-bud pattern. Vascular lesion, suggestive of aneurysm dependent on pulmonary circulation, possibly Rasmussen's aneurysm.

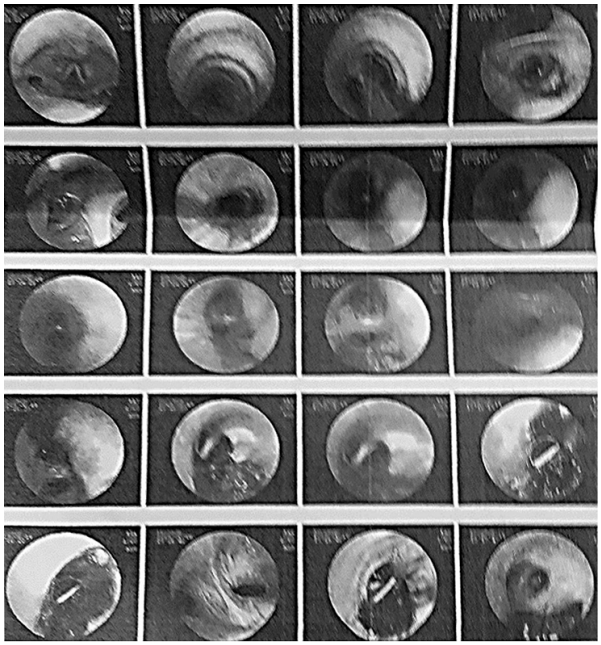

Figure 3. Fibrobronchoscopy: signs of old and recent bleeding of left bronchial tree, probably of the lingula, old blood clots in right bronchial tree.

DISCUSSION

Beyond the initial management of hemoptysis and patient's stabilization, the etiological diagnosis is hindered by the vast range of hemoptysis-causing diagnoses in the context of TB, active and latent. Some of these diagnoses are: reactivation of the tuberculous diagnosis, aspergilloma, neoplasias, bronchiectasis, chronic bronchitis, among others; all of which might coexist with a persistent hemoptysis, despite embolization of bronchial arteries *(Syed & Irby, 2015)*.

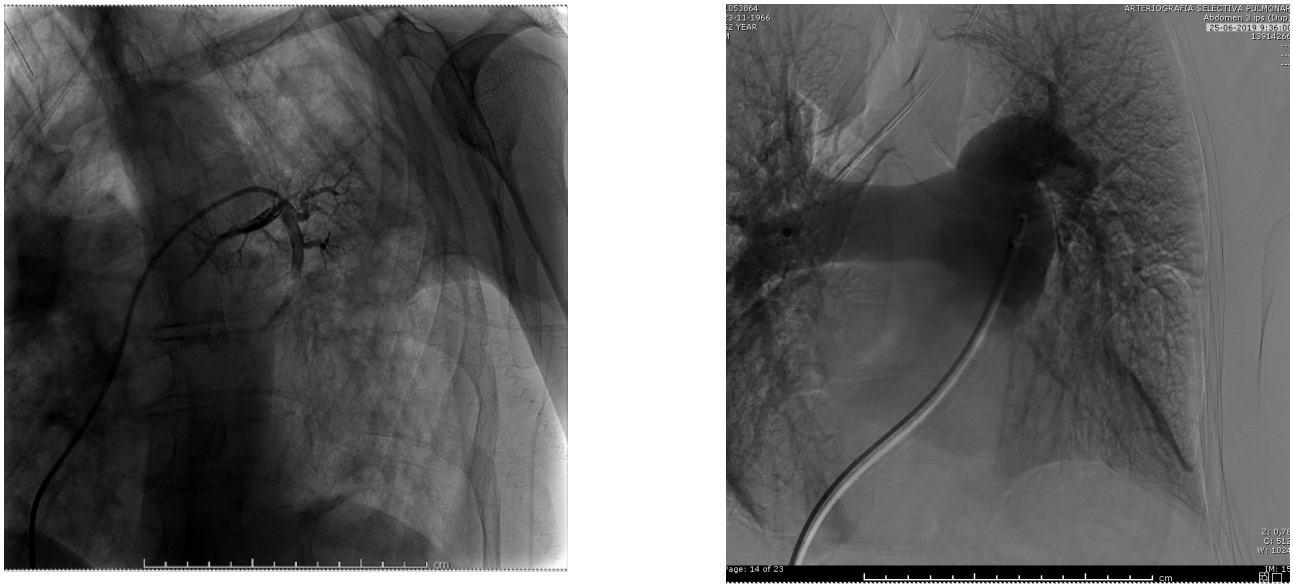

Figure 4. Endovascular (Pulmonary Angiography with Cavography): Amputation of distal third of segmental pulmonary artery carrying the pseudoaneurysm with complete spontaneous regression of left pulmonary artery branch pseudoaneurysm.

On suspicion, imaging study is needed via chest CT scan with contrast, in order to locate the hemorrhage's origin and visualize the aneurysms, as well as endoscopic study via FBC. While carrying out both studies increases sensitivity, the literature recommends starting with exploration via chest CT scan with contrast, due to its increased performance and availability. Finally, performing CT angiography of lung vessels would allow to objectively differentiate the affected vascular territory, when PA's risk is suggestive of this diagnosis *(Syed & Irby, 2015)*.

Regarding treatment, it is essentially endovascular, being embolization of the pseudoaneurysm the most evidence-based method *(Yoon et al., 2002; Rajamannar et al., 2017; Santelli & Katz, 1994)*, through different substances, such as embospheres, coils, glue, gelfoam, detachable balloons, and stents. Lobectomy is reserved for controlling MH with higher degrees of mortality *(Chatterjee et al., 2015)*. It is worth mentioning that post-operative management of RA must be performed in the ICU, due to the likeliness of immediate rebleeding and patient's monitoring.

RA corresponds to an infrequent cause of hemoptysis, whose clinical manifestation is potentially deadly, and demands a high suspicion rate, not only due to its low prevalence, but also since it requires a precise etiological study and endoscopic treatment that is often limited. Due to its historical association with TB, it is particularly significant in our country's reality, considering its recurrent nature and, therefore, its presence in previously treated subjects. It must be considered among the differential diagnoses of MH, especially on patients with pulmonary TB complications, such as the reported case. Due to its associated increased mortality, once RA is identified, it must be either endovascularly or surgically eradicated.

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