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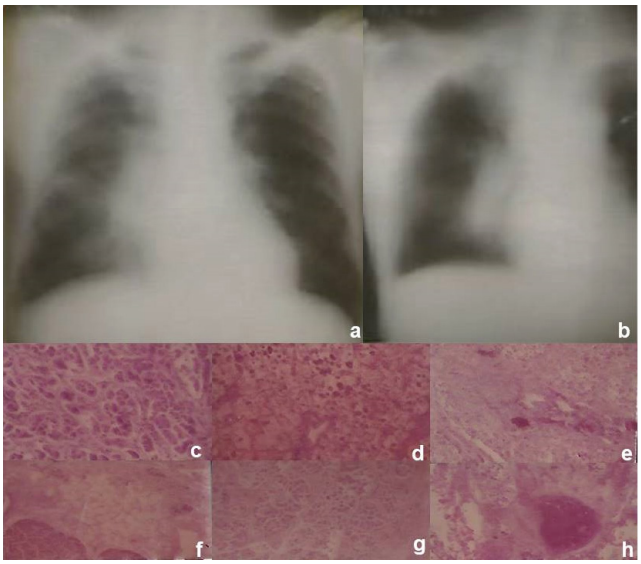

Figure 1. Chest X-rays showing lung density without "air bronchogram", mediastinal enlargement, and interstitial opacities involving the right lung (**a** and **b**); Photomicrographs of tissue specimens obtained at necropsy; H & E, (original x100): cells of the pulmonary carcinoma within the alveoli (**c**); Detail of tumor cell anaplasia (**d**); Epicardial involvement by tumor cells (**e**); Tumor invasion of the pericardial sac (**f**); Tumor cells within pulmonary lymphatics or "carcinomatous lymphangitis" (**g**); and metastasis in a lymph node (**h**).

A 30-year-old white man noticed right supraclavicular enlargement and signs of thrombophlebitis in the ipsilateral upper extremity. He also reported epigastric and lumbar pain, nausea, vomiting and progressive dyspnea. Since his 12 years of age, he has been a tobacco dependent and is categorized as a daily heavy smoker. On physical examination, the patient had tachypnea and a painless hard nodule (3 cm × 3 cm) in the right supraclavicular area. In the right pulmonary base there was mild dullness on percussion, and diffuse fine rales were heard. Chest radiographs showed images of a density in the right lung with mediastinal lymph node enlargement, and reticular interstitial opacities similar to Kerley B lines (Figure 1a and 1b). Lung function tests showed a mixed ventilation disorder with normal carbon monoxide diffusion and hypoxemia at rest without hypercapnia. He presented features of heart failure with rapid evolution to circulatory shock and death, in spite of intensive care support. Complete necropsy study was authorized and revealed the etiology of the lungs involvement, epicardium, pericardium, mediastinum, and lymphatic structures (Figure 1c to 1h).

What is your diagnosis?
See the next page for your diagnosis.

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Vitorino Modesto dos Santos, MD, PhD[1*]; Lister Arruda Modesto dos Santos, MD[2]

[1]Adjunct-professor, Internal Medicine Department, Armed Forces Hospital and Catholic University, Brasília-DF, Brazil.
[2]Preceptor of Medical Residency, General Surgery Department, State Worker's Hospital, São Paulo-SP, Brazil.
*Corresponding Author: Vitorino Modesto dos Santos, Hospital das Forças Armadas. Estrada do Contorno do Bosque s/n, Cruzeiro Novo. CEP 70.658-900, Brasília-DF, Brasil. Tel: +55 61-39662103; Fax: +55 61-32331599. Email: vitorinomodesto@gmail.com
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Photoclinic Diagnosis

Cardiac and lymphatic metastases from lung cancer

Metastatic cells of a primary lung cancer were found scattered to alveoli, epicardium, pericardial sac, lymph nodes, and pulmonary interstitium ("carcinomatous lymphangitis"). There was neither remarkable pericardial or pleural effusion, nor evident thromboembolism.

Cardiac metastases (CM) are not common, and there are scarce systematic studies about this condition.[1-6] The estimated incidence of CM is less than 30%, and pericardium, epicardium, myocardium, endocardium, heart cavities and vessels can be the affected sites.[1-8] The route of dissemination may be hematogenous, lymphatic, or direct extension.[1-4,6,8] Pericardium is often the most affected structure, mainly by CM from mesothelioma, and carcinomas of lung, ovary, stomach, and prostate; whereas epicardium is predominantly affected by melanoma and lung cancer; myocardium affected by melanoma or lymphoproliferative diseases; and endocardium affected by melanoma, renal and hepatic carcinomas.[1,2,4] These metastases are often clinically unsuspected, and final diagnosis is usually confirmed by thoracotomy or necropsy.[1-8] Cases involving CM comprise 2.3% of the total number of postmortem analyses.[2,6] Pulmonary cancers are the main malignancies with metastasis to the heart, and up to 35% of patients who died with lung carcinomas may have CM detected by necropsy.[1,5,7] Imaging studies have been very useful noninvasive tools for diagnostic evaluation of CM.[1,5,8] Electrocardiographic changes are nonspecific and include low voltage, ischemia, heart blocks, and arrhythmias.[3,4,7] This young male patient underwent a rapid evolution to death. Worthy of note, the clinical course of CM frequently deteriorates in a very short span of time; and characteristically, the cardio respiratory failure do not improve by conventional treatments.[9,10] A possible concern in this case might be about disseminated malignancy associated with carcinomatous lymphangitis, condition that can cause diagnostic challenges, especially if occurs in young patients.[9,10] The aim of the comments herein included, is to enhance the suspicion index of health workers about the occurrence of CM, and of carcinomatous lymphangitis in the course of lung cancers.

Authors' Contribution
Both authors participate on the conception and design, collection and interpretation of data, literature search, and writing and review of the manuscript.

Conflict of Interest Disclosures
The authors have no conflicts of interest.

Ethical Statement
In writing the manuscript, the authors followed the policy of the Committee on Publication Ethics (COPE).

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