Arch Bronconeumol. 2009;**45(2)**:103-104

ARCHIVOS DE BRONCONEUMOLOGIA

www.archbronconeumol.org

Letters to the Editor

Black Pleural Fluid

Líquido pleural de color negro

To the Editor:

Fluid taken from a patient with pleural effusion for assessment of etiology should always be described macroscopically. Characteristics such as color, smell, appearance, and degree of cloudiness of the supernatant following centrifugation all yield clues as to the origin of the effusion.[1] Black pleural fluid has only been reported on 3 occasions: associated with pleural infections caused by Aspergillus niger and Rhizopus oryzae in 2 cases,[2,3] and in a case of empyema apparently resulting from esophageal perforation caused by a tube used in an activated-charcoal treatment for overdose.[4] We report the unusual case of a patient with malignant pleural fluid that was seen to be black in color when drained by a pleural tap.

The patient, an 89-year-old farmer and a heavy smoker (80 pack-years), was receiving treatment for arterial hypertension. He visited his local hospital complaining of a 2-year history of dry cough, accompanied by progressive dyspnea that appeared in response to moderate effort and significant weight loss. Physical examination revealed the patient to be thin and eupneic, with normal vital signs, 92% oxygen saturation breathing room air, no palpable lymph nodes, and signs of pleural effusion in the right hemithorax. A laboratory workup revealed microcytic hypochromic anemia, thrombocytosis, and hypoalbuminemia. A standard chest radiograph showed massive right-sided pleural effusion, with ipsilateral volume loss and without mediastinal displacement. A black, nonodorous fluid was drained by a diagnostic pleural tap (Figure), and centrifugation produced a yellow supernatant and black sediment. Light's criteria were used to classify the exudate (red blood cells, 5000/μL; white blood cells, 34 000/μL). The white blood cells were predominately mononuclear (80%). Glucose levels were low (5 mg/dL) and the pH was 7.0. Staining and cultures for mycobacteria and fungi were negative. Cytology showed large cells that had a malignant appearance and pigment-laden macrophages on Prussian blue staining, indicating the presence of hemosiderin. Scattered groups of neoplastic cells arranged in rows and in gland-like structures were observed in a closed biopsy of the parietal pleura. Flexible fiberoptic bronchoscopy revealed thickened and redundant proximal right lower lobe mucosa, although no changes in coloring or vascularity were observed; the biopsy reported a finding of carcinoma. A chest radiograph showed enlarged lymph nodes in the hilum ipsilateral to the site of the pleural effusion. Other studies for metastasis proved negative. The diagnosis was nonsmall cell lung cancer, subtype adenocarcinoma, stage IIIB ($T_4 N_1 M_0$). The patient was referred to oncology for palliative treatment.

Metastatic pleural carcinoma, which is the second leading cause of exudative pleural effusions, is mainly caused by lung cancer, particularly adenocarcinoma.[1] Around half of all cases of blood-tinged effusions are malignant.[5] The mechanism that facilitates the entry of blood to the pleural cavity appears to be enhanced vascular permeability, the result of increased concentrations of vascular endothelial growth factor produced by malignant cells deposited in the pleura.[6] In the case reported here, we suggest that the black color of the pleural fluid was a result of hemosiderin-laden macrophages present in large quantities following massive bleeding into the pleura, although we cannot say precisely when this hemorrhage occurred in our patient. A finding of low pleural fluid glucose levels and the pH observed, along with positive cytology and biopsy results, are all related to a large tumor mass,[1] and it is quite likely that high vascular endothelial growth factor concentrations would facilitate extravasation of blood into the pleural space.

Figure. Black pleural fluid obtained in a pleural tap.

References

1. Light RW. Pleural diseases. 5th ed. Philadelphia: Lippincott, Williams & Wilkins; 2007.
2. Kimmerling EA, Fedrick JA, Tenholder MF. Invasive Aspergillus niger with fatal pulmonary oxalosis in chronic obstructive pulmonary disease. Chest. 1992;101:870-2.
3. Lai CC, Liaw SJ, Hsiao YC, Chiu YS, Laio WY, Lee LN, et al. Empyema thoracis due to Rhizopus oryzae in an allogenic bone marrow transplant recipient. Med Mycol. 2006;44:75-8.
4. Justiniani FR, Hippalgaonkar R, Martínez LO. Charcoal-containing empyema complicating treatment for overdose. Chest. 1985;87:404-5.
5. Villena V, López-Encuentra A, García-Luján R, Echave-Sustaeta J, Álvaez-Martínez CJ. Clinical implications of appearance of pleural fluid at thoracocentesis. Chest. 2004;125:156-9.
6. Ishimoto O, Saijo Y, Narumi K, Kimura Y, Ebina M, Matsubara N, et al. High level of vascular endothelial growth factor in hemorrhagic pleural effusion of cancer. Oncology. 2002;63:70-5.

José Rafael Rojas-Solano,[a,*] Richar W. Light,[b] and Alejandro Brenes-Dittel[c]

[a] *Servicio de Neumología, Hospital México, Caja Costarricense de Seguro Social, La Uruca, San José, Costa Rica*
[b] *Allergy, Pulmonary, and Critical Care Division, Vanderbilt University, Nashville, Tennessee, USA*
[c] *Servicio de Neumología, Hospital San Juan de Dios, Caja Costarricense de Seguro Social, La Uruca, San José, Costa Rica*

*Corresponding author:
E-mail address: jrrojas@yahoo.com (J.R. Rojas-Solano).

Lung Cancer Mortality in Spain

Mortalidad por cáncer de pulmón en Espña

To the Editor:

We read with interest the article by Cayuela and coworkers[1] on lung cancer mortality in Spain, recently published in *Archivos de Bronconeumología*. We fully agree with the authors in regard to their method, which is widely used in the literature; we also agree with their conclusions pointing to a lung cancer mortality trend in Spain which, as in other European countries, reflects changes in smoking habits.

Nonetheless, we cannot agree with the justification for the study. The authors state as follows: "In Spain, studies reporting trends in cancer mortality were carried out during the late 1980s and early 1990s... There are no recent studies on lung cancer mortality in Spain that allow us to ascertain whether the changes observed in Andalusia and the rest of Europe can also be observed in the Spanish population as a whole." They further state: "To our knowledge, this is the first analysis of trends with national data and a long follow-up period (25 years)."

In 2002, we published an analysis of lung cancer mortality for both men and women in Spain based on an age-period-cohort model; this study, completed in the second half of the 1990s, referred to a 25-year period covering 1973-1997.[2] In 2005, we published a study based on data up to 2002 that indicated the beginnings of a smoking-associated lung cancer epidemic among Spanish women.[3]

Other authors have also published analyses of data for Spain and other European countries. In 2007, for example, Levi et al[4] communicated the results of a joinpoint regression analysis of data referring to the period 1970-2004 for young women in a number of European countries, but paying particular attention to Spain and France. Another study (cited by Cayuela and coworkers), published in 2004, used age-period-cohort models to conduct a detailed analysis of mortality data for the period 1968-1997 for Spain and other members of the European Union, which, at that time, was composed of 15 member states.[5] Yet another study (also cited by Cayuela and coworkers), published in 2005, used joinpoint regression analysis to study lung cancer mortality in women from Spain and a number of other European countries for the period 1965-2001.[6]

Consequently, there were studies analyzing lung cancer mortality with a long follow-up period (25 years) after the late 1980s and in the early 1990s that analyzed lung cancer mortality, whether exclusively in Spain or in Spain and other countries.

References

1. Cayuela A, Rodríguez-Domínguez S, López-Campos JL, Vigil E, Otero R. Mortalidad por cáncer de pulmón en España. Evolución en 25 años (1980-2005). Arch Bronconeumol. 2008;44:70-4.
2. Franco J, Pérez-Hoyos S, Plaza P. Changes in lung-cancer mortality trends in Spain. Int J Cancer. 2002;97:102-5.
3. Franco J, Marín J. The beginning of the tobacco-related lung-cancer epidemic among Spanish women. Int J Cancer. 2006;118:1063-4.
4. Levi F, Bosetti C, Fernández E, Hill C, Lucchini F, Negri E, et al. Trends in lung cancer among young European women: the rising epidemic in France and Spain. Int J Cancer. 2007;121:462-5.
5. Bray F, Tyczynski JE, Parkin DM. Going up or coming down? The changing phases of the lung cancer epidemic from 1967 to 1999 in the 15 European Union countries. Eur J Cancer. 2004;40:96-125.
6. Bosetti C, Levi F, Lucchini F, Negri E, la Vecchia C. Lung cancer mortality in European women: recent trends and perspectives. Ann Oncol. 2005;16:1597-604.

José Franco[a] and Julio Marín[b]

[a] *Servicio de Neumología, Hospital Clínico Universitario, Valencia, Spain*
[b] *Departamento de Medicina, Universitat de Valencia, Valencia, Spain*

*Corresponding author:
E-mail address: franco.jos@gva.ers (J. Franco).