October 2012 Pulmonary Case of the Month: Hemoptysis from an Uncommon Cause

Lewis J. Wesselius, MD

Department of Pulmonary Medicine
Mayo Clinic Arizona
Scottsdale, AZ

History of Present Illness
A 39 year old woman is seen with a history of cough intermittently productive of small amounts of blood or blood-tinged sputum for 4 months. She reports no other respiratory symptoms and has otherwise felt well.

PMH, FH and SH
There was no significant PMH and no prior history of lung disease. Her father has a history of Parkinson’s disease and osteosarcoma. She is a nonsmoker, does not drink alcohol, and has never abused drugs. She has 2 children and is engaged to be remarried.

Physical Examination
Her physical examination is normal.

Chest X-ray
Her chest x-ray is below (Figure 1).

Figure 1. Panel A: Frontal chest radiography. Panel B: Lateral chest radiography.
Laboratory Evaluation
Hemoglobin was 13.2 g/dL and WBC was 8400 cells/μL with a normal differential. Urinanalysis was unremarkable.

Which of the following statements regarding hemoptysis is or are true?
1. A normal chest x-ray makes a benign cause of the hemoptysis more likely
2. Most patients with lung cancer are asymptomatic
3. Hemoptysis in children is usually associated with an infection or a foreign body
4. 1 + 3
5. All of the above
Hemoptysis is coughing up of blood that originates from the lungs. Upper airway bleeding is a common cause of spitting up blood and a source can often be identified by a careful history and physical exam. A chest x-ray is an important diagnostic test in patients with hemoptysis. A normal chest x-ray indicates there is less than a 5% chance of an endobronchial lesion on bronchoscopy. An abnormal chest x-ray often indicates the source of the bleeding. Most patients with lung cancer have symptoms including hemoptysis but most commonly include cough, weight loss, dyspnea, chest pain, bone pain, or hoarseness. About 27-29% of patients with lung cancer present with hemoptysis. Most children with hemoptysis have infection or a foreign body as their cause of hemoptysis.

Our patient’s chest x-ray was interpreted as normal. She was seen by ENT but no source of bleeding was identified on rhinolaryngoscopy. However, she returned three months later with persistent hemoptysis and now had dyspnea on exertion and mild fatigue.

A chest x-ray was interpreted as abnormal showing multiple pulmonary nodules and a CT scan was performed (Figure 2).
Figure 2. Represent images from the thoracic CT scan showing multiple pulmonary nodules.

Which of the following are causes of multiple pulmonary nodules?
1. Metastatic carcinoma
2. Fungal infection
3. Paragonimiasis
4. Pulmonary arteriovenous malformations
5. All of the above
The differential diagnosis of hemoptysis and multiple pulmonary nodules is large and includes all of the above. Metastatic carcinoma from a multitude of sources is certainly possible. In the Southwest US coccidioidomycosis is common and can present in a many ways including multiple pulmonary nodules. Paragonimiasis from eating inadequately cooked shell fish is common in Southeast Asia but uncommon in the US. Pulmonary arteriovenous malformations are a cause of multiple nodules but there is no evidence to support that diagnosis in this patient.

Metastatic tumors that tend to hemorrhage (choriocarcinoma, renal cell carcinoma, melanoma, thyroid carcinoma, Kaposi’s sarcoma) or invasive infections may present with fuzzy borders or an area of ground glass density surrounding the nodule (halo sign). This patient had a reversed halo or atoll sign which is a focal, rounded area of ground-glass surrounded by an approximately complete ring of consolidation. Although originally described as being specific for cryptogenic organizing pneumonia the reversed halo sign has since been described in many conditions including sarcoidosis, infections (paracoccidioidomycosis, tuberculosis, zygomycosis, aspergillosis), Wegener's granulomatosis, lymphomatoid granulomatosis, and bronchioloalveolar carcinoma.

At this juncture a tissue diagnosis is needed and either bronchoscopy or needle biopsy is indicated. Bronchoscopy was chosen because it directly visualizes the airways and hemoptysis often results from airway lesions. Bronchoscopy did reveal blood in the airways but no endobronchial lesions were identified. Bronchoalveolar lavage had returns of bloody fluid with hemosiderin-laden macrophages seen on cytology but no malignant cells were identified. Smears and cultures were all negative.

The patient was referred for video-assisted thorascopic surgical (VATS) biopsy. The pathology slides are shown in Figure 3.
Figure 3. Panels A-C: Low power H&E stains of the VATS biopsy. Panel D: High power.

Which of the following are not shown on the biopsy?
1. Nodules surrounded by normal lung tissue
2. Hemorrhage
3. Mitosis on high power
4. Fungal elements consistent with coccidioidomycosis
Correct!

4. Fungal elements consistent with coccidioidomycosis

The pathology diagnosis was epithelioid hemangioenothelioma or angiosarcoma based on the pattern of growth, cellularity, cellular atypia and immunostaining that was positive for CD 31 and CD 34. There is no evidence of coccidioidomycosis.

An angiosarcoma is an uncommon malignant neoplasm characterized by rapidly proliferating, extensively infiltrating anaplastic cells derived from blood vessels. Angiosarcomas are aggressive and tend to recur locally, spread widely, and have a high rate of lymph node and systemic metastases. The rate of tumor-related death is high. Primary pulmonary angiosarcomas are extremely rare and when angiosarcomas are present in the lung often result from metastasis from the heart, pulmonary arteries or another distant site.

In this patient pulmonary CT angiography and echocardiography did not reveal a primary tumor. She is currently undergoing chemotherapy.

References