Left Upper Lobe Mass and Diffuse Reticular-Nodular Infiltrate*

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We encountered a clinical problem in a young man who presented with a left upper lobe mass and a diffuse reticular-nodular infiltrate. We thought we had appropriately applied Murphy's Law (the famed bank robber who "went where the money is"), and Ockham's Razor (the philosopher William of Ockham [1285 to 1349]—"Entities are not to be multiplied beyond necessity") as we rapidly diagnosed the lung mass with computed tomography, scintigraphy, and fine-needle aspiration. However, when his invaluable previous chest radiographs arrived, bronchoscopy with transbronchial biopsy, bronchoalveolar lavage, brushings, and postbronchoscopy sputum revealed the more ominous diagnosis in this patient. This case illustrates the complementary nature of current imaging and bronchoscopy techniques; but, even more importantly, it demonstrates the value of the history coupled with the previous radiograph. Even an unusual case can provide lessons in cost containment.  

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A 44-year-old man presented to our hospital for evaluation of a left upper lobe lung mass. The patient had a 100 pack-year history of tobacco abuse and a chronic cough productive of white sputum. He denied any history of fever, night sweats, or known tuberculosis exposure. He was a janitor and had no significant occupational history. He kept no pets. He noted progressive symptoms of dyspnea, nausea, vomiting, and a 23-kg weight loss over a 3-month interval. His medical history was significant for a gunshot wound in 1969 with rupture of the left hemidiaphragm and spleen necessitating splenectomy.

CASE REPORT

Physical examination revealed a thin white man. His blood pressure was 128/74 mm Hg, pulse was 76, and temperature 36.6°C, with a respiratory rate of 16. There was no palpable adenopathy. The lung fields were clear to auscultation. Cardiac examination showed a regular rate and rhythm without murmurs. Findings from the abdominal examination were normal with no organ enlargement. The left testicle was enlarged and firm but nontender and not fixed to the scrotum.

The leukocyte count was 14,800/mm³ with a hemoglobin of 16

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FIGURE 1. The computed tomographic scan at the tracheal level shows a 6-cm-wide, 3-cm-thick, and 11-cm-long soft-tissue mass abutting the pleural surface with biopsy needle in place. This mass extended into the mediastinum on more caudal images.

g/dl and a hematocrit of 48 percent. Urinalysis showed 3 to 4 WBCs and 15 to 19 RBCs. HIV test was negative. The PPD skin test was positive with 20-mm induration. Three acid-fast smears were negative. Ultrasound of the testicle demonstrated a large homogeneous hydrocele with thickened epididymis. The chest radiograph at the time of hospital admission demonstrated an ill-defined posterior left upper lobe mass extending to the mediastinum and a diffuse bilateral reticular nodular infiltrate. The CT scan is shown in Figure 1. The diagnosis of intrathoracic splenosis and lymphangitic adenocarcinoma was made.

A CT-guided fine needle aspiration and core biopsy of the left upper lobe mass using a 22-gauge Greene needle and a 20-gauge spinal needle was performed. The fine-needle aspiration revealed benign-appearing lymphoid cells; however, the core biopsy specimen revealed aggregates of lymphoid tissue with sinusoidal features consistent with spleen (Fig 2). A 99mTc sulfur colloid RBC scan with thoracic window confirmed the presence of splenic tissue in the anterior and posterior left apex. Small implants of splenic tissue were also noted in the abdomen posterior to the liver.

Although the diagnosis of intrathoracic splenosis was confirmed, this entity did not explain the constitutional illness and progressive dyspnea. The chest radiograph also revealed a diffuse bilateral reticular-nodular infiltrate not present on a radiograph taken at another institution 2 months earlier. This diffuse process was evaluated with bronchoscopy with transbronchial biopsies,

FIGURE 2. A core needle biopsy specimen of the left upper lobe mass reveals aggregates of lymphoid tissue with sinusoidal features diagnostic of splenic tissue.
bronchoalveolar lavage, bronchial brushings, and postbronchoscopic sputum analysis. All of the above cytologic specimens revealed adenocarcinoma and the transbronchial biopsy specimen revealed adenocarcinoma in the submucosal lymphatics (Fig 3). Sputum and bronchoalveolar lavage were negative for acid-fast bacilli.

**DISCUSSION**

Intrathoracic splenosis results from the implantation of splenic tissue into the thoracic cavity after traumatic rupture of the spleen with simultaneous rupture of the left hemidiaphragm. Small fragments of spleen may transverse rents in the normal diaphragm so diaphragm rupture is not always found. The ability of the splenic pulp to implant itself on the serosal surfaces of the abdomen and chest, derive its own blood supply, and grow into mature splenic tissue represents the basic pathogenesis of this entity. The transplanted tissue functions as a normal spleen.

Although rare when compared with splenic implants in the peritoneal cavity (more than 75 reported cases), intrathoracic splenosis is to be considered in the differential diagnosis of left-sided chest masses with any history of trauma. It can be diagnosed by noninvasive or minimally invasive techniques that can save most patients from undergoing unnecessary, costly surgery as well as resultant second splenectomy.

There are 16 previous reports of intrathoracic splenosis in the English-language literature. The age of the patients is between 17 and 51 years, including 13 men and 3 women. A history of thoracoabdominal trauma, penetrating in 11 and blunt in 5, is present in all patients. Splenectomy was performed in 15 patients (data not available in one) and was associated with diaphragm repair in 10 cases. The time lapse between the initial accident and the discovery of the thoracic mass ranged from 9 to 32 years with a mean 16 years. Thoracic splenosis was discovered on a routine chest radiograph in 15 instances and once at autopsy. The radiologic profile of the lesion was that of a solitary coin lesion (four patients), multiple nodular opacities (ten patients), and a pericardial tumor in one patient.

Thoracotomy was performed in 13 patients with findings of encapsulated reddish brown masses scattered throughout the thoracic cavity. Nodule size ranged from 7.5 cm to a few millimeters. Two of these cases have been diagnosed by percutaneous core-needle biopsy, one by fine needle cytology, and another with radionuclide imaging.

Splenosis may be demonstrated scintigraphically using any agent that is sequestered by the spleen. Technetium (Tc-99m) sulfur colloid liver scanning was an early technique used. This scanning method has recently been supplemented by autologous heat-damaged RBC scan. The heat-damaged RBC technique appears to be superior to the sulfur colloid method because there is less uptake of the radionuclide by normal liver tissue, resulting in a higher target-to-background ratio. Indium-111-labeled platelet scans also effectively diagnose this condition. The radionuclide methods are more sensitive to the presence of small amounts of functioning spleen than the demonstration of Howell-Jolly bodies on the peripheral blood smear. With the refinement of radionuclide imaging, particularly the use of technetium-99m heat-damaged RBC scan, a diagnosis of intrathoracic splenosis can be definitively made without invasive procedures. This, most importantly, is safer for the patient, and is cost and time effective. It is now generally accepted that in a patient with any history of thoracoabdominal trauma with splenic and diaphragmatic rupture and an asymptomatic thoracic mass, the initial diagnostic modality should be scintigraphy.

In the majority of cases of intrathoracic splenosis, the patients present with asymptomatic chest masses or with symptoms that could not be reasonably attributed to an isolated chest mass. In fact, there are so few complications of intrathoracic splenosis that it is best to leave the functional splenic tissue in place to avoid the hypoplastic state. However, in our case, the presence of a large posterior mediastinal left hemithorax mass in a patient with a dramatic constitutional illness was particularly ominous and prompted an aggressive diagnostic approach at the time of initial evaluation. The diffuse reticular-nodular pattern noted on initial chest radiograph further complicated the clinical picture. Once the old radiographs were mailed to us, the interstitial infiltrate was confirmed as a new acute process and the focus shifted to bronchoscopy as the best diagnostic approach. Despite the presence of a large thoracic mass ultimately determined to be an unusual benign entity, there were coexistent radiographic abnormalities of the interstitium that represented a far more common terminal disease process that was responsible for patient’s extended illness.

**REFERENCES**

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