A 75-year-old woman is readmitted to hospital for the fourth time in 2 years with profound hyponatremia. Each episode was preceded by vomiting and mild diarrhea and was associated with confusion, and each resolved following conservative management with fluid restriction. No specific cause was ever found. Her previous health was excellent other than hypertension, osteoporosis, and osteoarthritis, for which she receives diclofenac, misoprostol, etidronate, enalapril, and atenolol. Her son stated that she has had right flank discomfort for the past 3 months, during which she lost 15 to 30 lb (6.8 to 13.6 kg). She was born in India and lived in North America for over 20 years. She is a nonsmoker.

Physical examination is completely normal except for profound confusion. Laboratory examination indicates normal CBC count and urinalysis. The serum sodium is 103 mEq/L (103 mmol/L), potassium 2.5 mEq/L (2.5 mmol/L), chloride 85 mEq/L (85 mmol/L), and bicarbonate 26 mEq/L (26 mmol/L). Serum osmolality is markedly reduced. Urine sodium is 64 mEq/L (64 mmol/L). A chest radiograph and CT scan led to a chest MRI. The representative images are shown in Figures 5A, 5B, 5C, and 5D. A bronchoscopy shows no evidence of tumor or infection. Which of the following is the most likely diagnosis?

A. Metastatic lung cancer.
B. Pulmonary and spinal tuberculosis.
C. Drug-induced inappropriate antidiuretic hormone syndrome.
D. Histoplasmosis.
5. B. Pulmonary and spinal tuberculosis.

The syndrome of inappropriate antidiuretic hormone secretion (SIADH) is defined as the following: (1) hyponatremia with corresponding hypoosmolality of the serum and extracellular fluid; (2) continued renal excretion of sodium; (3) absence of clinical evidence of fluid volume depletion (i.e., normal skin turgor and blood pressure); (4) osmolality of the urine greater than appropriate for the tonicity of the plasma (i.e., urine less than maximally dilute); (5) normal renal function; and (6) normal adrenal function. SIADH has been described in a variety of conditions, including respiratory disorders, such as pulmonary tuberculosis, pneumonias, and bronchogenic carcinoma. The basic management of SIADH is restriction of water intake, in addition to the treatment of the primary disorder. Our patient clearly has SIADH, and the differential diagnosis should include disorders associated with it.

Our patient has had weight loss, flank pain, a chest radiographic abnormality showing a right lung density, and evidence on CT scan and MRI of an epidural abscess. While many entities can cause thoracic spine destruction, intervertebral disc destruction strongly suggests an infectious process. In this patient, a nonsmoking Indian immigrant, the most likely diagnosis is tuberculosis of the spine (tuberculous spondylitis, or "Pott disease") (choice B is correct). A needle aspiration of the epidural abscess confirmed the diagnosis. Assessment by an orthopedic surgeon or neurosurgeon is appropriate, because there may be cord compression, even if there are no clinical features to suggest it. Most patients respond to routine antituberculous chemotherapy without surgical intervention. In most series of skeletal tuberculosis, Pott disease makes up 50 to 70% of cases reported. In adults, the lower thoracic and upper lumbar vertebrae are most commonly involved, whereas, in children, the upper thoracic vertebrae predominate. Evidence of previous or current pulmonary tuberculosis is found in about 50% of patients. Most patients present with pain, with or without systemic signs of infection.

While the patient has SIADH, she is not receiving any medication that has been associated with this syndrome (choice C is incorrect). Common medications associated with SIADH are chlorpropamide, carbamazepine, cyclophosphamide, vincristine, vinblastine, amitriptyline, haloperidol, the selective serotonin reuptake inhibitors, and the monoamine oxidase antidepressants. Metastatic lung cancer can be associated with SIADH but would not account for the epidural abscess visualized on MRI (choice A is incorrect). Histoplasmosis, while rarely associated with SIADH, would be unlikely to cause the destruction of the vertebrae and the epidural abscess (choices D is incorrect).

You are asked to see a 34-year-old man who was seen in the emergency department for dyspnea and hemoptysis. He is from Afghanistan and emigrated to Canada 5 years ago. He was quite well until 3 months ago when he developed a cough intermittently productive of clear sputum. He was given a course of antibiotics by his family physician with no improvement. He then noticed intermittent scanty hemoptysis.

Because of progressive exertional dyspnea, he presents to the emergency department. He also complains of mild, left-sided pleuritic chest pain and a 5-lb (2.3-kg) weight loss. He denies fever, sweats, or chills. On examination, his blood pressure is 115/82 mm Hg, pulse 108/min and regular, respiratory rate 24/min, and temperature 36.3°C. Other than scattered, left basal crackles, the physical examination is normal. The hemoglobin is 14.8 g/dL (148 g/L), WBC count 10,600/mm³ (10.6 x 10⁹/L), and platelet count 11,500/mm³ (11.5 x 10⁹/L). Arterial blood gases while breathing room air indicate a PO₂ 64 mm Hg, PCO₂ 33 mm Hg, pH of 7.45, and HCO₃ 23 mEq/L (23 mmol/L). A chest radiograph (see Figure 38A) and two images of a chest CT scan (see Figures 38B and 38C) are shown.

Bronchoscopy with BAL is normal and shows no evidence of malignancy or infection. Following the procedure, within the next 12 h, he rapidly deteriorates with worsening dyspnea. He is transferred to the ICU, and a pulmonary artery catheter is inserted. The pulmonary artery pressure is recorded at 110/40 mm Hg, and the pulmonary artery occlusion pressure is normal. The most likely diagnosis is:

A. Acute thromboembolic disease.
B. Tumor emboli.
C. Idiopathic pulmonary hypertension.
D. Pulmonary venoocclusive disease.
B. Tumor emboli.

The chest radiograph shows right hilar prominence, and the two CT scans show no evidence of large pulmonary emboli. There are a number of irregular, focal, ill-defined nodules seen in both lungs. One of the largest is a 1-cm nodule in the apical posterior segment of the left upper lobe. There is also bilateral hilar and subcarinal increased density likely representing matted, enlarged lymph nodes. With the rapid appearance of severe pulmonary hypertension and the abnormal chest radiograph and CT scan, the most likely diagnosis is tumor emboli with pulmonary hypertension (choice B is correct). The patient died shortly after admission to the ICU, and postmortem evaluation revealed widespread metastatic gastric cancer with tumor emboli. The CT scan indicates patent large pulmonary arteries, so the diagnosis of acute thromboembolic disease is not tenable (choice A is incorrect). Chronic thromboembolic disease with pulmonary hypertension is still possible, despite the negative CT scan results, but this is not offered as a choice. Idiopathic pulmonary hypertension can be diagnosed in young men rarely, but this diagnosis does not explain the chest CT scan findings (choice C is incorrect). Patients with pulmonary venoocclusive disease are usually elderly and present with a chest radiograph suggestive of pulmonary venous hypertension, a finding not present on this radiograph (choice D is incorrect).

The incidence of tumor emboli is difficult to establish, but autopsy series reveal a range of 2.4 to 26% of patients. Common sources of tumor emboli include liver, breast, stomach, renal, and prostatic cancers and choriocarcinoma. Pulmonary involvement includes occlusion of the main pulmonary artery by a large amount of tumor material, microscopic arteriolar emboli, diffuse alveolar septal capillary involvement, lymphangitic carcinomatosis, or a combination of these entities. The classic finding of pulmonary hypertension with right ventricular strain is reported in only 15 to 20% of patients. Usually, the initial presentation is entirely nonspecific, and there are no clinical features that can separate tumor emboli from thromboembolic pulmonary disease. Chest radiographs usually reveal normal findings, but occasionally, focal or diffuse heterogeneous opacities are observed, which may be interpreted as lymphangitic carcinomatosis, especially in patients with known cancer. Cardiac enlargement and prominent pulmonary arteries are infrequent findings, despite the elevation of pulmonary artery pressure, presumably because of the rapid onset of the disease. CT scanning may reveal dilated and beaded peripheral pulmonary arteries. Additionally, bilateral, peripheral, wedge-shaped opacities that suggest pulmonary infarcts have been reported. Radionuclide perfusion scans may reveal small, peripheral, subsegmental perfusion defects, whereas ventilation scans are usually normal. Pulmonary angiography is usually unrevealing but may show delayed filling of the segmental arteries, pruning, and tortuosity of the third- to fifth-order vessels, and subsegmental filling defects. Cytologic examination of an aspirate from the pulmonary artery catheter may allow a premortem diagnosis to be established.