Wegener's granulomatosis presenting as a large solitary cavitary mass

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A 29-year-old woman presented to the emergency department with a 1-month history of nonproductive cough that had recently worsened and a new-onset sore throat. She had been treated 1 month earlier by her primary care physician for "sinusitis." She had no chest pain or dyspnea; she reported fevers but was afebrile at the time of examination. Chest x-ray demonstrated a patchy infiltrate in the superior segment of the left lower lobe with central cavitation, with the impression of left lower lobe pneumonia, probably cavitary (*Figure 1*). She was treated with a 7-day course of levofloxacin and a methylprednisolone dose pack.

The patient returned to the emergency department 15 days later with worsened cough and new-onset dyspnea and hemoptysis as well as malaise and myalgias. A basic metabolic panel revealed elevated blood urea nitrogen and creatinine levels, 33 and 3.0 mg/dL, respectively. A repeat chest x-ray (*Figure 2*) and computed tomography (CT) scan of the chest (*Figures 3 to 5*) were performed.

Figure 1. Posteroanterior chest radiograph on initial emergency department visit demonstrates left lower lobe rounded opacity with central lucency.

DIAGNOSIS: Wegener's granulomatosis.

DISCUSSION

Wegener's granulomatosis is a systemic necrotizing vasculitis that primarily affects the lungs and kidneys. The mean age of diagnosis is 40 years, but Wegener's granulomatosis can occur at any age. Whites are affected most commonly, and men and women are equally affected.

This patient initially visited her primary care physician with symptoms of sinusitis and cough. At the initial emergency department presentation 1 month later, her symptoms included

Figure 2. Posteroanterior chest radiograph on repeat emergency department visit 15 days later shows persistent left lower lobe opacity with cavitation as well as new bilateral diffuse alveolar opacities with relative subpleural sparing.

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Figure 3. CT axial image through the upper lobes demonstrates bilateral diffuse alveolar opacities with subpleural sparing.

Figure 4. CT axial image through the left lower lobe shows a large cavitary mass lesion.

only worsened cough and subjective fevers. While Wegener's granulomatosis may have imaging features including large cavitary masses, the initial imaging presentation of a solitary large cavitary mass is somewhat atypical. The return emergency department visit prompted further imaging, which demonstrated additional features consistent with the diagnosis of Wegener's granulomatosis.

Pulmonary involvement is present in up to 90% of patients with Wegener's granulomatosis (1). Typical clinical presentation with respiratory symptoms includes cough, hemoptysis, and dyspnea. Renal involvement is seen in up to 80% of patients and usually shows a nonspecific glomerulonephritis on renal biopsy specimens. Lung biopsy usually shows a granulomatous small-vessel necrotizing vasculitis (1). Disease activity is

Figure 5. CT coronal reformatted image demonstrates both the cavitary mass lesion in the left lower lobe and the bilateral diffuse alveolar opacities with subpleural sparing.

often assessed by serum analysis for C-antineutrophil antibodies against protease 3 in cytoplasmic granules (c-ANCA) (2).

Imaging features are the result of an immunologically mediated necrotizing vasculitis that results in several different findings. The most common manifestation of lung involvement is lung nodules (2, 3). These are usually multiple and bilateral with the size varying from a few millimeters up to 10 centimeters (4). Cavitation of the nodules is common. Approximately 25% of nodules >2 cm demonstrate this finding (2, 3). Other imaging manifestations include lung consolidation and ground-glass opacities, mosaic attenuation, tree-in-bud opacities, and interlobular septal thickening. Alveolar hemorrhage usually accounts for the consolidation and ground-glass opacities, while the mosaic attenuation and tree-in-bud manifestations often relate to arteriolar involvement (5). Subpleural sparing of the lung is a frequent imaging finding and was seen in this patient. Late or chronic pulmonary complications include focal or diffuse large airway involvement. The subglottic trachea is most commonly affected and usually demonstrates concentric wall thickening.

Treatment varies but usually includes immunosuppressant therapy, such as systemic steroids and cyclophosphamide.

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