An Unusual Cause of Pulmonary Nodules in a Patient With Relapsing Polychondritis

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Introduction

Pulmonary nodules are defined by a size < 3 cm, whereas a lung mass is defined by a size > 3 cm. Excellent clinical practice guidelines for evaluating patients with a solitary pulmonary nodule for possible lung cancer have been published.[1,2] The appearance of pulmonary nodules in an immunocompromised host is a common clinical problem that falls outside the scope of published algorithms. Because the differential diagnosis includes infection, malignancy, and inflammatory disorders (such as vasculitis and sarcoidosis), a thorough workup is required. The clinician must combine imaging and clinical data to determine a differential diagnosis. After developing a differential diagnosis, an understanding of the risks and benefits of invasive testing, as well as the strengths and limitations of locally available resources, is needed to determine a diagnostic plan that is individualized for the patient. To illustrate this process, we present a case of multiple pulmonary nodules in a woman with a history of relapsing polychondritis.

Case Summary

A 46-y-old African American female with history of relapsing polychondritis was admitted with progressive dyspnea and dry cough for 2 months. She had no history of smoking. She had been previously treated with various immunosuppressive regimens, including prednisone, cyclophosphamide, methotrexate, and cyclophosphamide. However, her immunosuppression was stopped 3 months earlier. She was afebrile with normal vital signs and a normal pulmonary exam. Evidence of recurrent nasal and auricular cartilage inflammation and damage was noted. Initial laboratory tests revealed mild leukocytosis and normal liver and kidney function. A chest computed tomography (CT) scan revealed multiple lung nodules (Fig. 1).

A wide differential, including infections, malignancy, autoimmune disorders or vasculitides, medication toxicity, and atypical organizing pneumonia, was considered. Because there were multiple nodules that varied in size, metastatic disease was higher on the differential than a primary lung cancer. She was not currently taking any medications classically associated with organizing pneumonia, but organizing pneumonia either as a drug reaction or idiopathic was felt to be part of the differential diagnosis. Opportunistic infection, such as a fungal infection, was the most immediate concern due to the potential for such infection to progress and cause deterioration in the patient's otherwise stable condition. Therefore, the benefits of tissue sampling were felt to be greater than the risks. A CT-guided percutaneous biopsy showed granulomatous pneumonitis, but it was felt that additional tissue was needed to rule out infectious etiologies (particularly fungal infections). The patient was brought to the operating room, and flexible bronchoscopy revealed severe tracheal stenosis. Rigid bronchoscopy was then used to maintain airway patency because the patient could not be intubated with an endotracheal tube. A flexible bronchoscope was introduced through the rigid scope, and electromagnetic navigational bronchoscopy was used to obtain biopsy samples of the left upper lobe nodule.

Workup for infections and vasculitides was negative (Table 1). Biopsies of the nodules showed non-necrotizing granulomas with giant cells, consistent with a diagnosis of sarcoidosis, without any evidence of infection or malignancy (Fig. 2).

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Dr Malodiya presented a version of this paper at Chest 2013, held October 26–31, 2013, in Chicago, Illinois.

Dr O'Brien has disclosed relationships with Actelion Pharmaceuticals, United Therapeutics, CSL Behring, and INO Therapeutics. Drs Malodiya and Vest have disclosed no conflicts of interest.

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DOI: 10.4187/respcare.03191

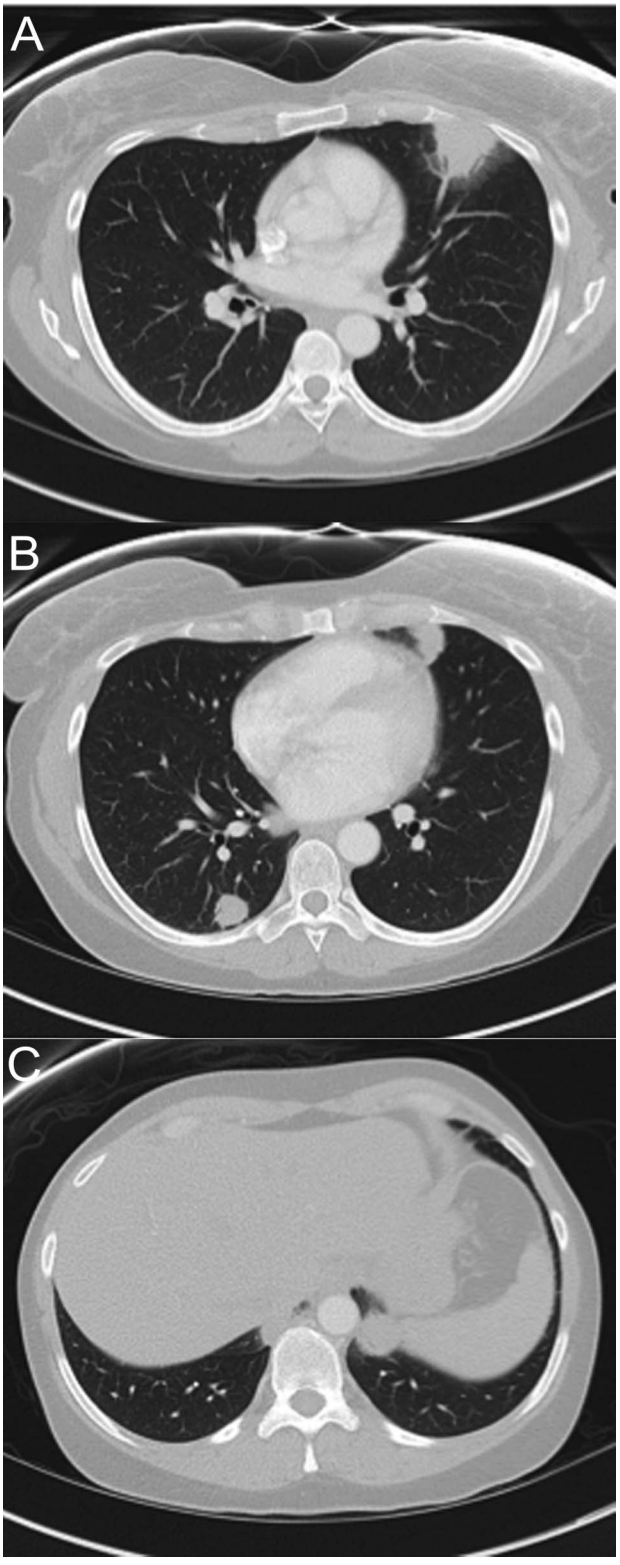

Fig. 1. Representative images of the lung nodules on presentation. The computed tomography did not show a pulmonary embolism. However, it did show 4 pulmonary nodules: a 1.5 × 1.7-cm lesion in the right lower lobe, a 1.1 × 2.2-cm lesion in the right lower lobe, a 2.1 × 2.2-cm lesion in the left lower lobe, and a 3.0 × 2.8-cm lesion in the left upper lobe.

Table 1. Investigations to Evaluate Infections and Vasculitis

	Results
Investigations done for infectious etiology	
HIV serology	Nonreactive
QuantiFERON and acid-fast bacilli smear for tuberculosis	Negative
Peripheral blood cultures for bacteria and fungus	Negative
Tissue cultures from biopsy specimen	Negative for any bacterial or fungal growth
Cryptococcal antigen test	Negative
Histoplasma antigen test	Negative
Coccidioidomycosis serology	Negative
BAL fluid culture	Negative
Investigations done for vasculitis/autoimmune etiology	Results
P-ANCA level (unit)	< 0.2
C-ANCA level (unit)	< 0.2
ACE level (units/L)	63

HIV = human immunodeficiency virus
BAL = bronchoalveolar lavage
P-ANCA = perinuclear anti-neutrophil cytoplasmic antibody
C-ANCA = cytoplasmic anti-neutrophil cytoplasmic antibody
ACE = angiotensin-converting enzyme

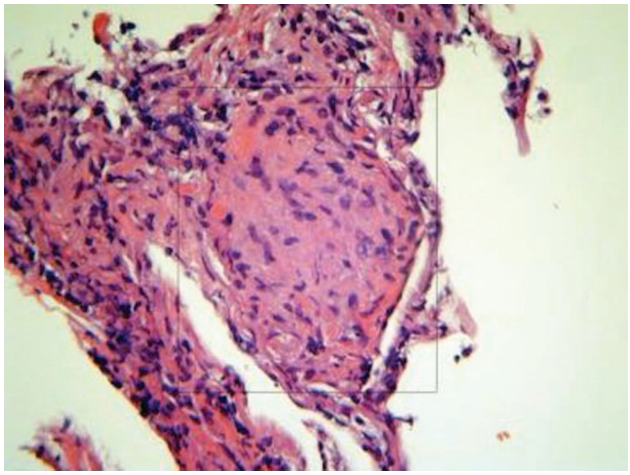

Fig. 2. Histology from a bronchoscopically obtained biopsy of the patient's nodule.

Based on her CT findings, laboratory workup, and biopsy results, a diagnosis of sarcoidosis was made, and prednisone (60 mg/d) was started. At the 6-month follow-up, the patient was completely asymptomatic, with immense radiological improvement (Fig. 3), and her steroids were tapered. However, due to her connective tissue disease, which included potentially life-threatening airway involvement, she required continued immunosuppression with prednisone and mycophenolate mofetil.

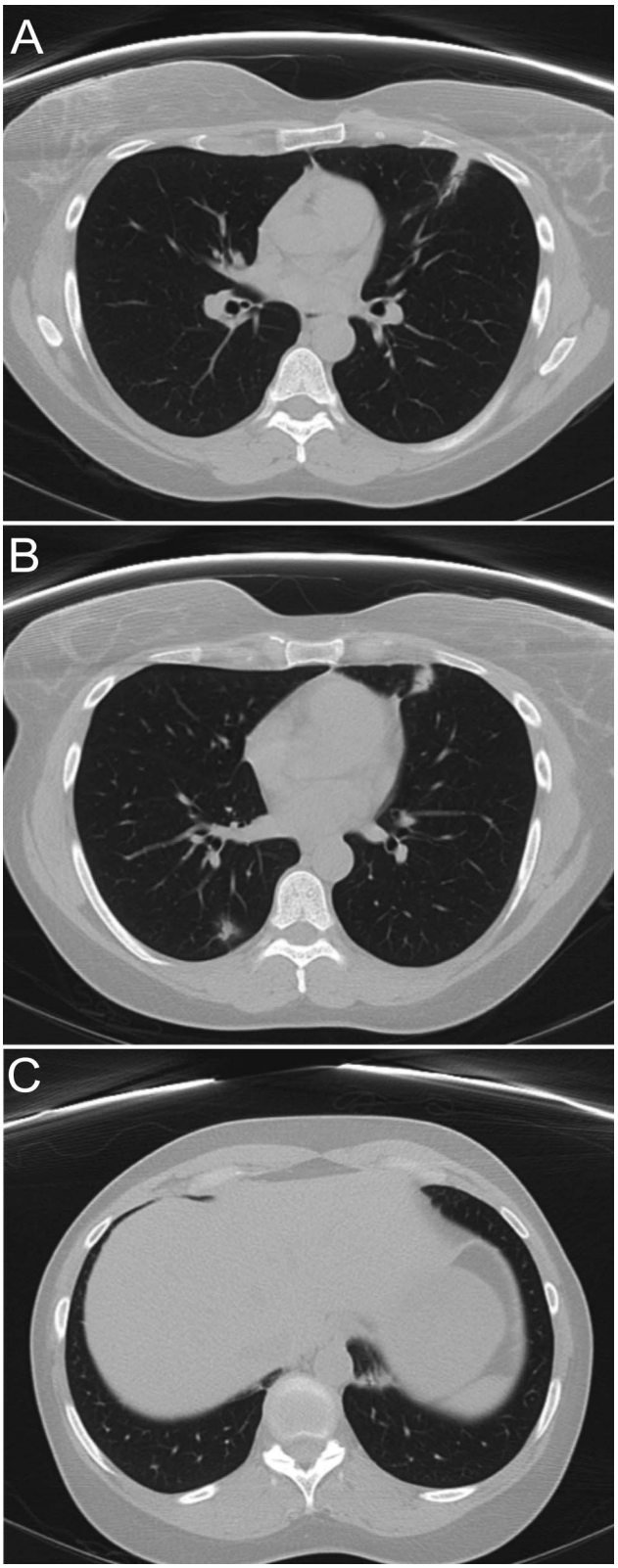

Fig. 3. The same representative areas as in Figure 1 shown after treatment with steroids.

Discussion

Relapsing polychondritis is characterized by recurrent episodic inflammation and progressive destruction of cartilaginous structures throughout the body. It commonly affects the ears, eyes, nose, larynx, and trachea, but even the heart, aorta, skin, joints, and nervous system can be involved.[3-5] Relapsing polychondritis is a rare autoimmune disorder of unclear etiology that occurs in all races and age groups, with men and women affected equally.[3-5] Pulmonary relapsing polychondritis is usually manifested by episodic tracheobronchial chondritis, which may result in life-threatening upper airway obstruction.[3,5,6] As a result of airway involvement, caution is needed in attempting airway procedures. Parenchymal nodules have not been described as a manifestation of relapsing polychondritis.[3,5,6] About 30% of patients have additional autoimmune disorders, most commonly connective tissue diseases and vasculitides.[3,7]

The variant nodular sarcoidosis is relatively rare, with an incidence of 1.5%.[8] The majority of patients are female smokers, with cough and shortness of breath being the most common presenting symptoms, as in our patient. Nodular sarcoidosis usually presents with multiple pulmonary masses that tend to be peripheral and are associated with mediastinal lymphadenopathy, and it has a favorable prognosis.[9]

Sarcoidosis is not known to be associated with relapsing polychondritis. Two other cases of coexisting relapsing polychondritis and sarcoidosis have been reported. One was a patient with acquired immune deficiency syndrome (AIDS), and the other was a patient with a known history of sarcoidosis who eventually developed relapsing polychondritis.[7,10] However, to our knowledge, this is the first case of coexisting relapsing polychondritis and nodular sarcoidosis to be reported in the literature.

Pulmonary nodules in sarcoidosis can be large, as in this case. The differential diagnosis of these nodules includes diseases that have important treatment implications, such as infection or malignancy. Our patient already had indications for immunosuppression due to her relapsing polychondritis, so ruling out infection was particularly important. We cannot know if her nodules would have regressed spontaneously without treatment. It is possible that immunosuppressive therapy for relapsing polychondritis may have masked longstanding sarcoidosis in our patient, and discontinuing immunosuppression simply revealed the disease. Therefore, it may not be possible to determine how often sarcoidosis truly coexists with other diseases treated with immunosuppression. However, the possibility of sarcoidosis revealing itself when appropriate symptoms develop in patients who have stopped longstanding immunosuppressive regimens may be worth considering.

Teaching Points

- Pulmonary nodules are a common clinical problem with a broad differential diagnosis, and they can be particularly challenging in an immunocompromised host.
- Tissue sampling may be required as part of this evaluation.
- Relapsing polychondritis is associated with inflammation, which can cause airway obstruction but is not a cause of pulmonary nodules.
- Bronchoscopists performing procedures on patients with relapsing polychondritis must be aware of potential airway complications and have available appropriate resources to manage these complications.
- Nodular sarcoidosis may be considered in the differential diagnosis of pulmonary nodules in patients with relapsing polychondritis.

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