CASE PRESENTATION

A 78 year-old woman presents to her primary provider with one week of respiratory and constitutional symptoms.

- Her symptoms start one day after visiting a friend in Grass Valley.
- She develops fever, non-productive cough, exertional dyspnea, fatigue.
- At baseline, she is able to walk three miles without difficulty; currently she becomes short of breath and winded before completing one block.
- She denies chest discomfort, orthopnea, paroxysmal nocturnal dyspnea.
- She does not have any sick contacts, but was exposed to two cats and mold while visiting her friend's home.

Past Medical History

- Breast Cancer: right sided stage I T1CNO HER2+/ER-PR-
- 9/2010: right lower extremity incision to achieve negative margins
- 2/2011: completed six cycles TCH (docetaxel, carboplatin, trastuzumab)
- 4/2011: completed course of adjuvant radiation
- Currently undergoing adjuvant chemotherapy with trastuzumab
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Social History

- Born in Sutton, England; retired secretary and homemaker; non-smoker; occasional alcohol and no illicit drug use

Significant Physical Exam Findings

- Caucasian alopecic woman in no respiratory distress
- Increased tactile fremitus and egophony in the right upper lobe; diminished breath sounds and increased dullness to percussion at the bases
- Right breast with healed surgical scar; no suspicious lesions in either breast
- No cervical, axillary, or inguinal lymphadenopathy

Labs/Imaging

- CBC is notable for white blood count 10.5, hemoglobin 11.2
- Chest X-Ray shows multiple areas of consolidation with air bronchograms in the right upper lobe and middle lobe, with volume loss and rightward shift of the mediastinum.

DISCUSSION

BOOP! THERE IT IS

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LEARNING OBJECTIVES

- Not all pneumonia is infectious.
- Noninfectious diffuse parenchymal lung disease (DPLD) should be considered when respiratory symptoms do not respond to anti-microbial therapy.
- Bronchiolitis obliterans organizing pneumonia (BOOP) is a DPLD which may be related to medications, radiation, malignancy, or autoimmune phenomena. The idiopathic form is referred to as cryptogenic organizing pneumonia (COP).

HOSPITAL COURSE

- She completes ten days of oral moxifloxacin, without symptom improvement.
- A second course of the same antibiotic is prescribed.
- Two weeks later, a chest x-ray shows worsening right-sided infiltrates, new left apical consolidation, and small bilateral pleural effusions.
- Given her refractory symptoms and progressive imaging findings, she is directly admitted to the hospital for further work-up.
- The patient is started on empiric therapy with intravenous Ceftriaxone and Azithromycin.
- High resolution CT chest with contrast shows diffuse parenchymal infiltrates with associated volume loss and pleural effusions.
- Coccidioides serology, aspergillus galactomannan, serum cryptococcal antigen and histoplasma serology and urine antigen are negative.
- Legionella urine antigen and serology, Mycoplasma serology, and Toxoplasma serology are negative.
- Testing for Mycobacterium Tuberculosis is negative.
- Autoimmune work up reveals negative ANA, RF and c-ANCA. P-ANCA is positive, but subsequent MPO and PR3 is negative.
- The patient undergoes diagnostic bronchoscopy which shows only minimal secretions and no gross abnormalities. The bronchoalveolar lavage (BAL) fluid shows a predominant lymphocytosis, with eosinophilia.
- Serum and BAL bacterial, viral, and fungal cultures ultimately grow no organisms.
- Transbronchial biopsy reveals filling of airspaces with fibroblasts and foamy macrophages, characteristic of BOOP. There is no evidence of malignancy.
- A video assisted thoracoscopic lung wedge biopsy confirms the diagnosis.
- The patient is taken off chemotherapy and anti-microbials and started on high dose oral steroids with subsequent symptom and functional improvement.

BOOP is a form of DPLD with an incidence of 7 per 100,000, usually presenting in the fifth-sixth decades of life. Patients present with an average of two months of symptoms, most commonly non-productive cough, exertional dyspnea, weight loss.

Imaging reveals bilateral consolidative and ground-glass opacities, which may be peripheral and migratory. Nodular lesions and honeycombing, along with pleural effusions are rarer findings.

Histologically, there is granulomatous tissue proliferation within the small airways and alveolar ducts, along with chronic inflammation in the surrounding alveoli.

The pathogenesis is not well understood. Abnormal vascular endothelial growth factor and matrix metalloproteinase regulation has been reported.

The idiopathic form of BOOP is referred to as COP, but there are a handful of cases in the literature implicating both trastuzumab and radiotherapy in the development of BOOP in breast cancer patients.

Two thirds of patients show complete clinical and radiographic improvement within several weeks to three months, with glucocorticoid therapy, but relapse is common with tapering doses and close monitoring is required.