# September 2016 Pulmonary Case of the Month

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### *History of Present Illness*

The patient is a 52 year-old woman with prior renal transplant in 1998 due to complications of pre-eclampsia. She had a recent decline in renal function leading to re-transplant on June 23 of this year. She was admitted to the hospital on July 8th with ventricular tachycardia. Treatment with amiodarone was begun with no further ventriuclar tachycardia. She is also taking usual anti-rejection medications.

### *Past Medical History, Social History and Family History*

Other than the renal transplantation she has no other significant past medical history and has never smoked. Family history is noncontributory.

### *Physical Examination*

Physical examination was unremarkable other than the surgical wounds associated with her renal transplants.

### *Radiography*

Her chest x-ray is shown in Figure 1.

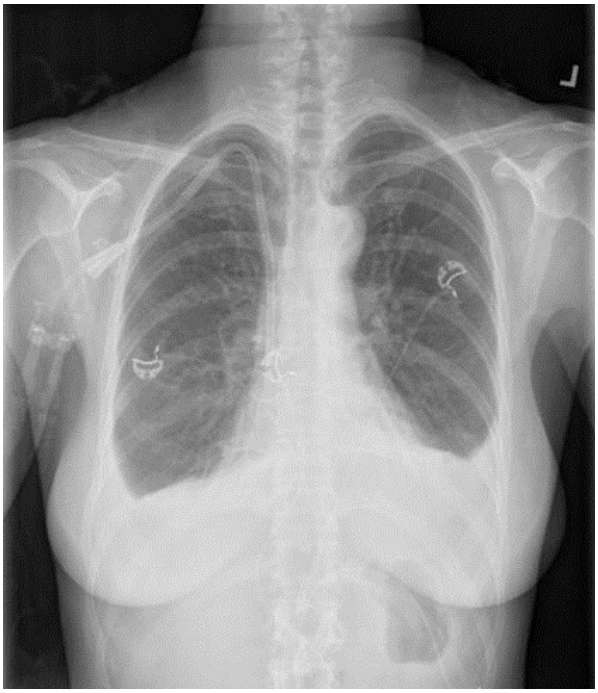

Figure 1. Admission chest radiograph.

What should be ***done at this time***?

1. Discontinue the amiodarone
2. Empiric antibiotics
3. Plasma brain naturetic peptide (BNP)
4. 1 and 3
5. All of the above

**Correct!**
**3. Plasma brain naturetic peptide (BNP)**

The chest x-ray shows small bilateral pleural effusions. The most common cause of bilateral pleural effusions is congestive heart failure. Given her clinical situation of having recent ventricular tachycardia this would be the most likely diagnosis (1). Plasma brain naturetic peptide (BNP) is often elevated in these patients and can be useful if there is uncertainty about the diagnosis. Presentation of a pneumonia as bilateral pleural effusion is unlikely. Our patient's BNP was moderately elevated. Amiodarone has a number of pulmonary toxicities including bilateral pleural effusions on very rare occasions (2). Amiodarone pulmonary toxicity usually manifests as an acute or subacute pneumonitis, typically with diffuse infiltrates on chest x-ray and high-resolution computed tomography. The risk benefit ratio was felt to favor continuing the amiodarone. She was discharged from the hospital on July 11th clinically doing well.

However, she was readmitted to the hospital on July 16th with low grade fever and chest discomfort. Her physical examination revealed a Temperature of 38.2, SpO2 94% on 2 Lpm, blood pressure 103/63 mm Hg and a pulse of 90.
Her chest examination was fairly unremarkable with diminished BS but no crackles. Admission laboratory showed a hemoglobin of 8.6 g/dL and a white blood count of 11,200 cells/mcL. Electrolytes revealed a mild hyponatremia of 133 mEq/L with a serum creatinine of 2.3 mgs/dL. A repeat chest x-ray was performed (Figure 2).

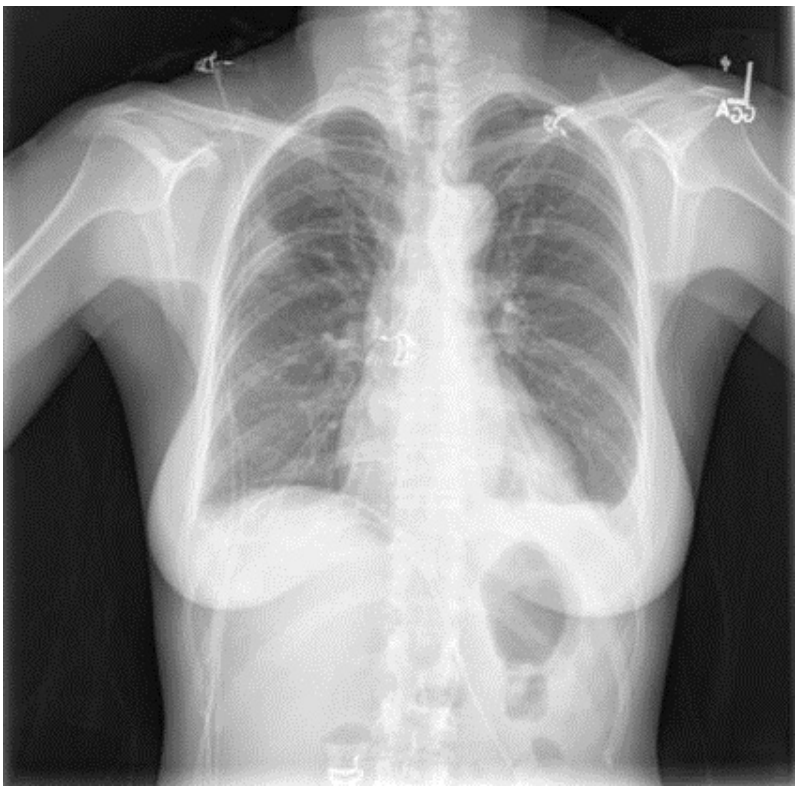

Figure 2. Initial chest radiograph taken after second admission.

What should be ***done at this time***?

1. Bronchoscopy with bronchoalveolar lavage
2. Coccidioidomycosis serology
3. Thoracic CT scan
4. 1 and 3
5. All of the above

**Correct!**
**5. All of the above**

Compared to her previous chest x-ray in figure 1 the pleural effusions are smaller, however, there is a new right upper lobe density. A thoracic CT scan was performed (Figure 3).

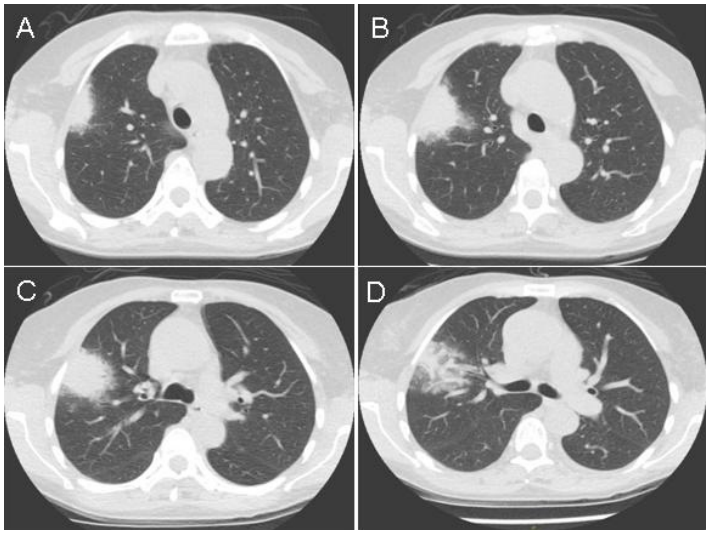


Figure 3. Representative axial images from thoracic CT scan in lung windows.

The patient is an immunocompromised host aggressive pursuit of a diagnosis is appropriate. Given the right upper lobe density likely represents a pneumonia. Most advise bronchoscopy with bronchoalveolar lavage as an initial step (3). A coccidioidomycosis serology is appropriate given the frequency of Valley Fever in Arizona.

A bronchoscopy was performed which showed no endobronchial masses with areas of bronchial erythema (Figure 4).

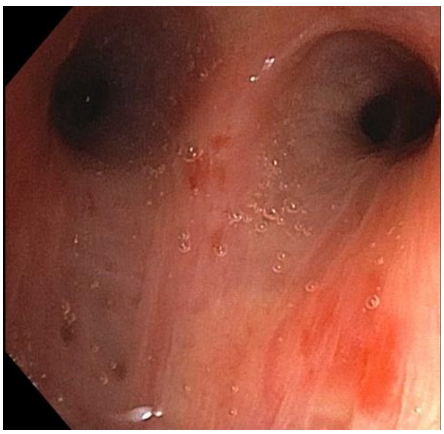

Figure 4. View of the main carina showing some areas of bronchial erythema.

Results of the bronchoalveolar lavage are shown in Table 1.

Table 1. Bronchoalveolar lavage results

- Cellular differential: 66% alveolar macrophages, 34% polymorphonuclear neutrophils
- Aspergillus antigen < 0.5
- Gram stain: rare gram + cocci
- Fungal smear: negative
- Mycobacterial smear: negative
- Pneumocystis stain: negative
- Nocardia stain: negative

In addition, a urinary antigen for Legionella was negative. The patient was started on meropenem, levofloxacin, and fluconazole. She was continued on tacrolimus and amiodarone. However, she continued to have fever and repeat chest x-ray was performed two days after the bronchoscopy (Figure 5).

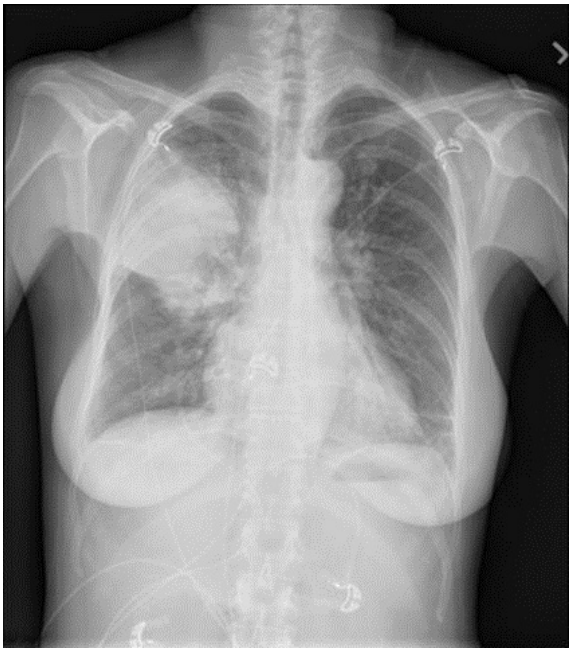

Figure 5. Repeat chest x-ray two days after the bronchoscopy.

What should be ***done at this time***?

1. Repeat bronchoscopy with bronchoalveolar lavage
2. Repeat bronchoscopy with transbronchial biopsy
3. Stop the amiodarone
4. Video-assisted throascopic surgery (VATS)
5. Any of the above

**Correct!**
**5. Any of the above**

Her chest x-ray shows worsening of her right lower lobe consolidation and a thoracic CT scan showed near complete consolidation of her upper right upper lobe with extension into the right middle and lower lobes. The cause of her pneumonia is unclear and it is not definitely clear how to proceed. Any of the options would probably be acceptable depending on local expertise and clinical judgment. Repeat bronchoscopy with bronchoalveolar lavage and transbronchial biopsy was offered to the patient. However, she was feeling slightly better and wanted to wait a few more days. Later that day the bronchoalveolar lavage polymerase chain reaction and culture both returned positive for Legionella. She was continued on her levofloxacin and made an uneventful recovery.

The mortality of Legionella is 16 to 30% but less than 10% with appropriate treatment (4). Azithromycin and levofloxacin both are both effective. There are no comparative studies but some suggest possible benefit from combined treatment. The duration of therapy is usually 10 to 14 days in immunocompetent patients and 21 days in immunosuppressed suppressed patients.

The urinary antigen for Legionella has a sensitivity of 80% and specificity close to 100%. The test is specific only for serogroup 1. However, the majority of Legionella in community-acquired pneumonia is serogroup 1.

Several signs and symptoms may be present in immuncompetent patients with community-acquired pneumonia suggesting Legionella (Table 2)

Table 2. Signs and symptoms suggesting Legionella pneumonia.

- Presence of GI symptoms, especially diarrhea
- Neurologic symptoms, especially confusion
- Fever > 39º C.
- Gram stain with white blood cells, few if any organisms
- Hyponatremia
- Hepatic dysfunction
- Hematuria

***References***


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4. Rathore MH, Bragg L. Legionella Infection. Medscape. March 26, 2016. Available at: http://emedicine.medscape.com/article/965492-overview (accessed 8/30/16).