

July 2013 Imaging Case of the Month

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Clinical History

A 64-year-old woman with a history of multiple sclerosis (wheelchair-bound), neurogenic bladder, and a number of other chronic medical conditions, presented with complaints of non-radiating neck pain without tingling or numbness. The patient also reported mild subjective fever and occasional nausea, but denied shortness of breath. Frontal and lateral chest radiography (Figure 1) was performed.

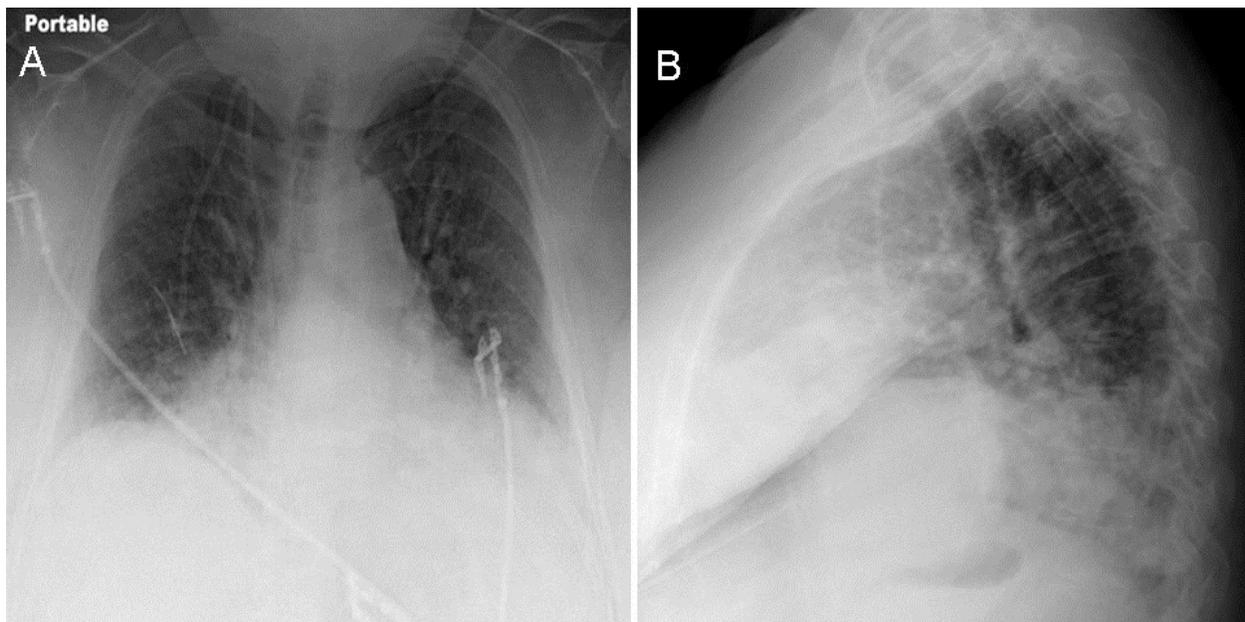


Figure 1. Frontal (Panel A) and lateral (Panel B) chest x-ray.

Which of the following statements regarding the chest radiograph is **most accurate**?

1. The chest radiograph shows bibasilar consolidation
2. The chest radiograph shows large lung volumes with cystic change
3. The chest radiograph shows multiple nodules
4. The chest radiograph shows no abnormalities
5. The chest radiograph shows symmetrical bilateral pleural effusions

Correct!

1. The chest radiograph shows bibasilar consolidation

The chest radiograph is abnormal, but shows only non-specific bilateral basal consolidation. No pleural effusions are seen. The lung volumes are not abnormally increased, and no pulmonary cysts are present; if anything, the lung volumes are diminished bilaterally. The chest radiograph does not show discrete nodules.

Which of the following is an appropriate consideration among the differential **diagnostic possibilities** for the appearance of the patient's chest radiograph?

1. Aspiration pneumonia
2. Bilateral bronchopneumonia
3. Idiopathic interstitial pneumonia
4. Pulmonary hemorrhage
5. All of the above

Correct!
5. All of the above

The basal opacities on the chest radiograph are very non-specific as regards their potential etiology. The opacities are consistent with consolidation, and therefore virtually any air-space filling process requires consideration. The most common etiology for such opacities is infection- bronchopneumonia- but the basal location renders aspiration pneumonia and idiopathic interstitial pneumonias legitimate considerations as well. Pulmonary hemorrhage could appear similarly also.

The patient underwent thoracic CT (Figure 2) for further characterization of the abnormalities seen at chest radiography.

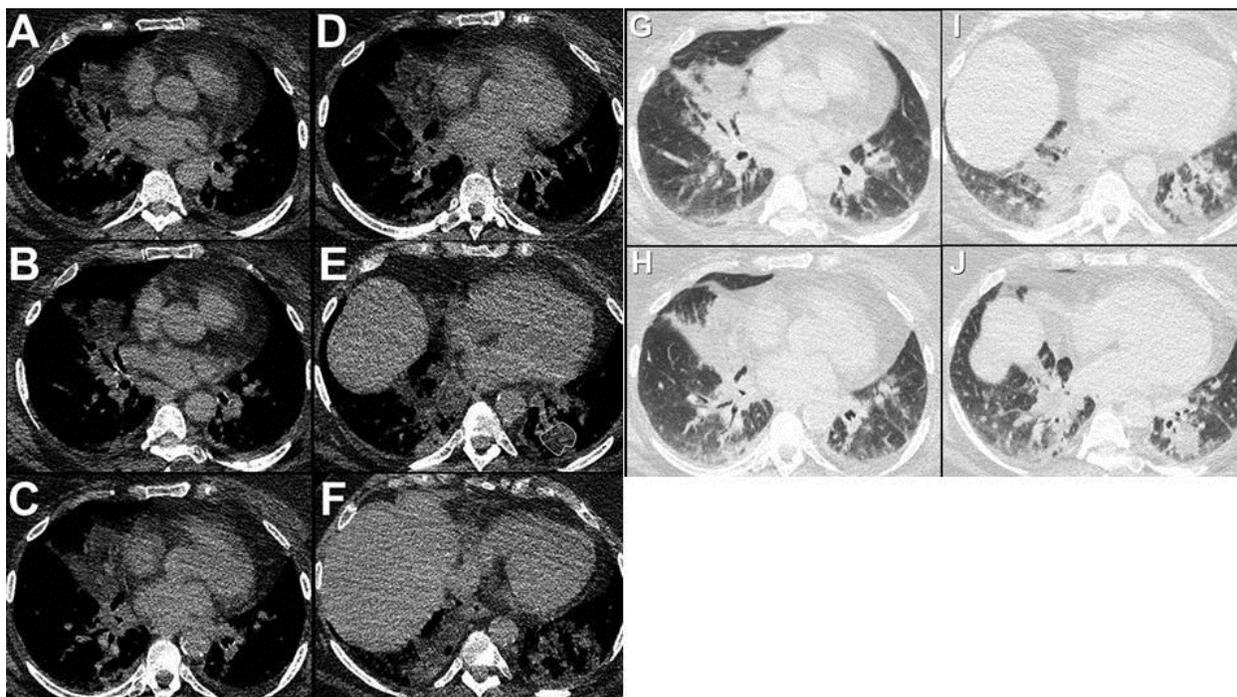


Figure 2. Axial thoracic CT shown in soft tissue (A-F) and lung (G-J) windows.

Which of the following statements regarding this CT examination is **most accurate?**

1. The thoracic CT shows bilateral basal consolidation and nodules, suggesting aspiration pneumonia and bronchiolitis
2. The thoracic CT shows bilateral basal ground-glass opacity and reticulation, suggesting non-infectious alveolitis with fibrosis
3. The thoracic CT shows bilateral basal high attenuation pulmonary parenchymal opacification, suggesting amiodarone pulmonary toxicity
4. The thoracic CT shows bilateral basal low attenuation consistent with pulmonary parenchymal fat
5. The thoracic CT shows non-specific bilateral basal consolidation and adds little to what is already known from chest radiography

Correct!

4. The thoracic CT shows bilateral basal low attenuation consistent with pulmonary parenchymal fat

The thoracic CT shows bilateral lower lung opacities consistent with a combination of ground-glass opacity and consolidation. In the denser consolidated areas, the soft tissue windows show low attenuation consistent with fat (Figure 3).

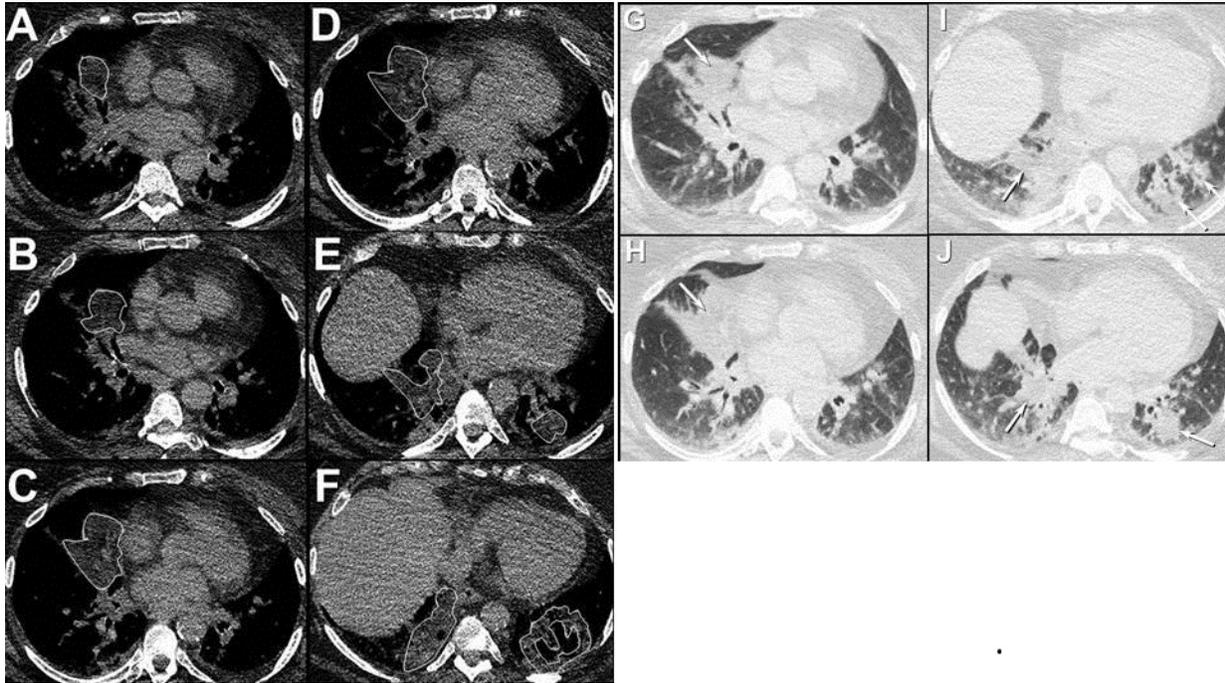


Figure 3. Axial thoracic CT shown in soft tissue (A-F) and lung (G-J) windows shows bilateral pulmonary parenchymal consolidation (arrows, G-J) in the right middle and lower lobes. The areas of consolidation are outlined in the soft tissue windows (A-F) and show that some of the consolidation consists of very low attenuation material. Note the resemblance of these areas to subcutaneous fat.

These areas consist of low attenuation, and not high attenuation, as may occur with amiodarone pulmonary toxicity. Through the demonstration of fat-containing pulmonary opacities, the CT adds significantly to information already known through chest radiography. The basal opacities could represent alveolitis, although there is relatively little reticulation and no hard features of fibrotic lung disease, such as honeycombing, traction bronchiectasis, or architectural distortion. Therefore, choice 4 is not the best answer. While the basal distribution of the opacities can be seen with aspiration pneumonia, centrilobular nodules, often seen with bronchiolitis in the setting of aspiration pneumonia, are not present.)

What is the **appropriate next step** for the evaluation / management of this patient?

1. ^{18}F FDG-PET scanning
2. Focused clinical history
3. Percutaneous transthoracic biopsy
4. Presumptive antibiotic therapy for fungal infection
5. Surgical lung biopsy

Correct!

2. Focused clinical history

Given the presence of pulmonary parenchymal fat, the pulmonary parenchymal opacification is not consistent with fungal infection and no clinical or laboratory data to suggest fungal infection are present. Surgical lung biopsy is an appropriate method for evaluation of diffuse lung diseases of unknown etiology, but the CT features in this case provide a specific diagnosis, and therefore this procedure is not required. Similarly, percutaneous transthoracic biopsy is useful for the diagnosis of a number of pulmonary disorders, typically focal nodular diseases, but is not required in light of the CT features. ¹⁸F-FDG-PET scanning would not add further information to what is already known through clinical history and imaging performed thus far. In light of the CT appearance of fatty consolidation, focused clinical history, searching for a correlate for this finding should be undertaken.

Based on the thoracic CT findings, additional history was elicited from the patient.

Which of the ***histories provided below matches the CT findings*** for this patient?

1. The patient admits to being trapped in a burning house for a prolonged period of time one year prior to presentation
2. The patient admits to injection drug abuse with opiates
3. The patient admits to owning several African grey birds
4. The patient admits to taking amiodarone for a cardiac dysrhythmia
5. The patient admits to taking mineral oil for constipation

Correct!

5. The patient admits to taking mineral oil for constipation

The patient admitted to nightly use of mineral oil in the attempt to relieve constipation. Aspiration of inert oily substances, such as mineral oil, may result in accumulation of the oil in the lung parenchyma, which can be detected as fatty attenuation consolidation at thoracic CT, enabling the diagnosis of lipoid pneumonia. The CT appearance in this case is not suggestive of hypersensitivity pneumonitis, and therefore the history of owning African grey birds is not the best answer. Similarly the history of injection drug use would suggest either septic embolization or opiate-related lung injury, and neither of those choices fits well with the CT findings in this patient. The history of being trapped in a burning house suggests a toxic exposure. Such an exposure may lead to constrictive bronchiolitis months or years later. However, the CT appearance of constrictive bronchiolitis consists of mosaic attenuation on inspiratory imaging and air trapping on expiratory imaging; these findings differ markedly than those found in this patient. Finally, amiodarone pulmonary toxicity may show areas of high attenuation, not low attenuation, in addition to features resembling an idiopathic interstitial pneumonia, such as peripheral nodular consolidation or peripheral ground-glass opacity and reticulation.).

Diagnosis: Lipoid pneumonia

References

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