March 2017 Pulmonary Case of the Month

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History of Present Illness

The patient is 52-year-old man who complained of dyspnea on exertion and a dry cough.

Past Medical History, Social History and Family History

He had a history of gastroesophageal reflux disease (GERD) and was taking a proton pump inhibitor.

He never smoked and had no known exposures.

Family history was noncontributory.

Physical Examination

Physical Examination was unremarkable.

Chest X-ray

A chest x-ray was reported as normal.

Which of the following are **indicated**?

1. Chest CT scan
2. Endoscopy/bronchoscopy
3. Pulmonary function testing
4. 1 and 3
5. All of the above

Correct!
4. 1 and 3

The patient's symptoms are unexplained and pulmonary function testing and a thoracic CT scan are good starting points to evaluate unexplained dyspnea. Endoscopy and/or bronchoscopy seem overly aggressive at this point since there is no evidence of pathology in the lung or the upper gastrointestinal tract.

The pulmonary function tests were unremarkable. The thoracic CT scan is shown in Figure 1.

Figure 1. Representative images from the thoracic CT in lung windows.

Which of the following **best describe** the lung findings on the thoracic CT scan?

1. Scattered ground glass opacities
2. Traction bronchiectasis
3. Small centrilobular nodules predominately in the lower lungs
4. 1 and 3
5. All of the above

Correct!
4. 1 and 3

There are both scattered ground glass opacities and small nodules present on the CT scan (Figure 2).

Figure 2. Thoracic CT in lung windows showing ground glass opacities (white square) and small centrilobular nodules (white circles).

Which of the following is/are **true** of centrilobular nodules?

1. Are diagnostic of hypersensitivity pneumonitis
2. Are usually caused by sarcoidosis
3. Can be associated with a variety of pulmonary infections
4. Touch the pleural surface
5. All of the above

Correct!

3. Can be associated with a variety of pulmonary infections

Centrilobular nodules are small nodules that usually do not touch and pleural surface. They have been commonly associated with hypersensitivity pneumonitis but can also be seen in respiratory broncholitis-interstitial lung disease, airway spread of carcinoma, and a variety of infections including bronchopneumonia, tuberculosis or nontuberculous mycobacteria, and Aspergillosis. Sarcoidosis is a common disease but is associated with perilymphatic nodules that touch the pleural surface.

Smears and cultures of sputum are negative for bacteria, fungi and acid-fast bacilli. A decision is made to proceed with a video-assisted thorascopic surgical (VATS) lung biopsy. Representative photomicrographs from the surgical specimens are shown in Figure 3.

Figure 3. Representative photomicrographs from the surgical specimens showing granulomatous inflammation.

Which of the following are **true** regarding granulomas?

1. Granulomas are a nonspecific finding that can be seen in a large number of disorders
2. Granulomas are diagnostic of sarcoidosis
3. Granulomas are not associated with Valley Fever
4. Granulomas are uncommon and seen in a few infections such as tuberculosis and some fungal infections
5. Granulomas are usually caused by histoplasmosis and are rarely seen in the Southwest

Correct!

1. Granulomas are a nonspecific finding that can be seen in a large number of disorders

A granuloma is a specific inflammatory response in tissue that usually contains histiocytes, mixed inflammation, and may or may not have giant cells and necrosis. Granulomas result from both noninfectious and infectious causes. Infectious causes include mycobacterial, fungal and some parasitic infections. Noninfectious causes include sarcoidosis, hypersensitivity pneumonitis, some vasculitic disorders, talc, beryllium, bronchocentric granulomatosis and aspiration of food particles.

Aspiration can be a particularly difficult diagnosis especially when it is chronic. Many of the common causes of aspiration such as depressed consciousness, vocal cord dysfunction, dysphagia, gastroesophageal reflux disease, or recurrent vomiting are not present, especially in the elderly (1). Although not elderly, our patient had only gastroesophageal reflux disease to suggest chronic aspiration.

The identification of food particles can be difficult on biopsy. The presence of foreign material on the lung biopsy can be easily overlooked by pathologists (1). In our patient, careful inspection of the lung biopsy revealed the presence of foreign material.

Our patient's barium swallow revealed severe reflux supporting aspiration as a cause. With airway-centered disease, regardless of the presence of foreign material, aspiration should be considered even in a patient without symptoms.

References

1. Hu X, Lee JS, Pianosi PT, Ryu JH. Aspiration-related pulmonary syndromes. *Chest*. 2015 Mar;147(3):815-23. [\[CrossRef\]](#) [\[PubMed\]](#)
2. Mukhopadhyay S, Katzenstein AL. Pulmonary disease due to aspiration of food and other particulate matter: a clinicopathologic study of 59 cases diagnosed on biopsy or resection specimens. *Am J Surg Pathol*. 2007 May;31(5):752-9. [\[CrossRef\]](#) [\[PubMed\]](#)