

September 2013 Pulmonary Case of the Month: Chewing the Cud

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History of Present Illness

A 30 year old Hispanic man presented to the emergency department (ED) after being involved in a motor vehicle accident. He was a restrained passenger and his car was hit from behind by another vehicle. His initial presenting complaints were chest and back pain.

PMH, SH, FH

The patient was originally born in Sonora, Mexico but moved to the Phoenix area in 1998. However, he traveled to Mexico frequently. He has no allergies and no significant past medical or surgical history.

His social habits include occasional alcohol consumption and a remote minimal smoking history. He denied illicit drug abuse. He was married and has 5 healthy children. He was working as a fork lift operator in a warehouse and was not taking any medications. A tuberculosis skin test and a human immunodeficiency virus (HIV) were negative 3 years ago when he applied for US Citizenship.

His parents are alive with hypertension and type 2 diabetes mellitus.

Physical Examination

His physical exam had normal vital signs and a Glasgow coma scale of 15. Physical exam showed clear lungs, normal heart sounds, and a benign abdominal exam. His neurological exam was normal.

Laboratory

His complete blood count (CBC) showed a white blood cell (WBC) count of 15.4×10^6 cells/mL, hemoglobin of 11.8 g/dL, a hematocrit of 36 % and a normal platelet count. His basic metabolic profile and liver function chemistries were normal.

Radiography

His chest x-ray is shown in Figure 1.

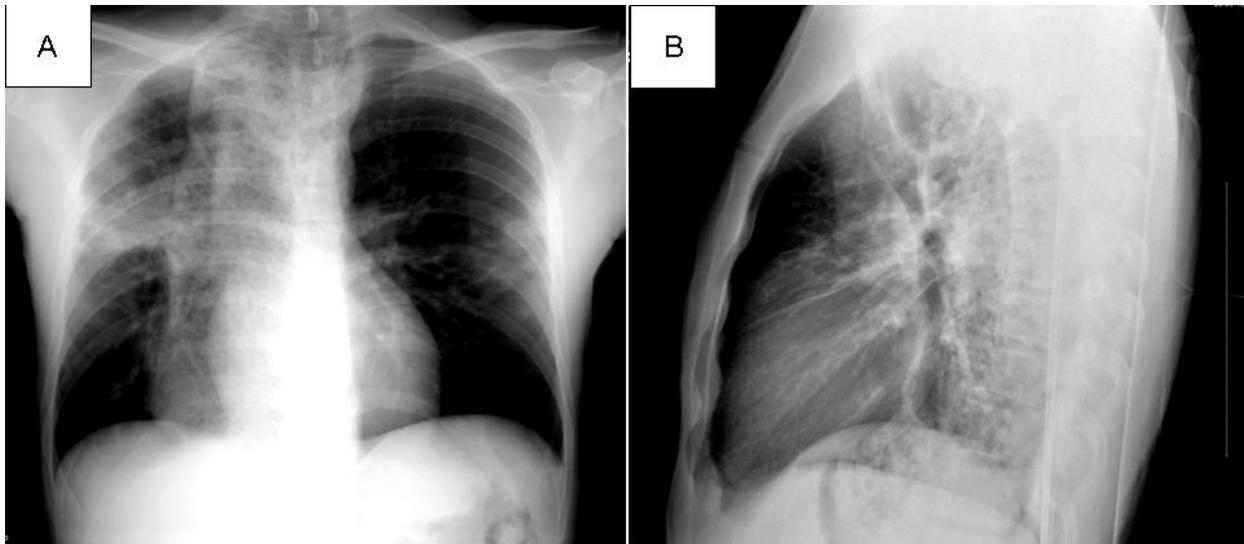


Figure 1. Admission PA (Panel A) and lateral (Panel B) chest x-ray.

Which of the following **best describes** the chest x-ray?

1. A density in the right chest consistent with a fractured right mainstem bronchus
2. An air-fluid level in the right chest consistent with a lung abscess
3. Consolidation in the lateral right lung
4. All of the above
5. None of the above

Correct!

3. Consolidation in the right lung

A large number of parenchymal chest injuries can result from blunt trauma incurred from a motor vehicle accident. These include pulmonary contusion, pleural injuries (pneumothorax, hemothorax), tracheal or bronchial tears, esophageal injuries and heart injuries (1). Laceration, tear, or disruption of the trachea or a major bronchus is life threatening. These injuries require surgical repair. Establishment of a secure and adequate airway is of primary importance. Patients with major bronchial lacerations or avulsions usually have massive air leaks. This results in the “fallen lung sign” where the lung falls away from the hilum. The esophagus is relatively protected from injury because its location in the posterior mediastinum. Blunt injuries of this organ are rare. However, when they do occur the injuries are usually caused by a sudden increase in esophageal luminal pressure resulting from a forceful blow. Injury usually occurs in the cervical region. Associated injuries to other organs are common. Physical clues to the diagnosis may include subcutaneous emphysema, pneumomediastinum, pneumothorax, or intra-abdominal free air.

There is clearly an area of consolidation extending to the right chest wall (Figure 2, black arrow). In addition, there is a large sac-like mass with air and fluid in the medial right chest (Figure 2, red arrows).

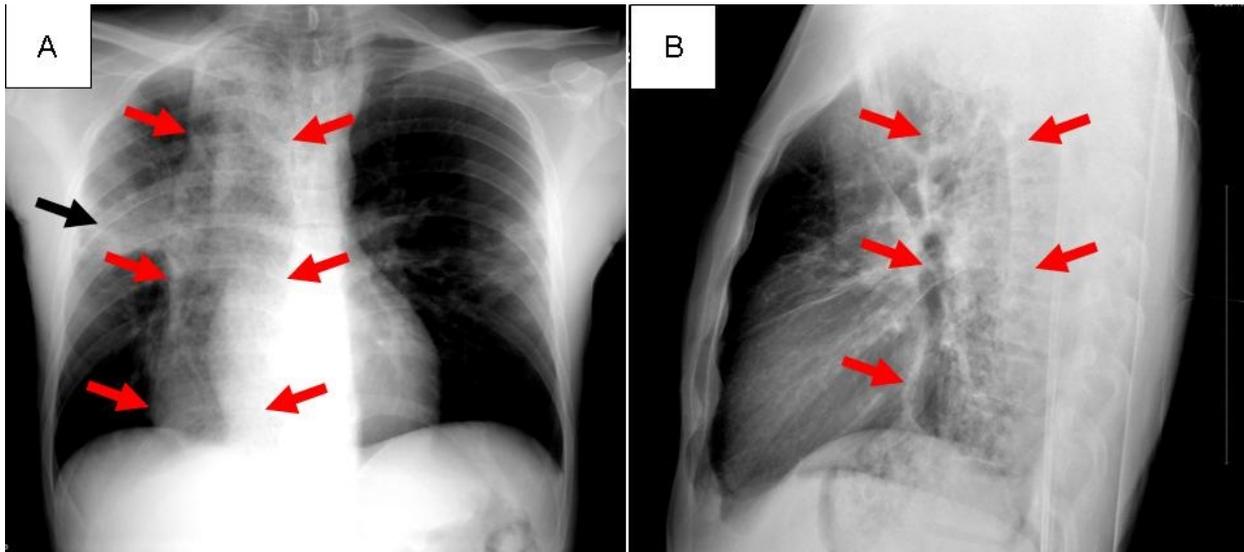


Figure 2. Admission chest x-ray showing an area of consolidation extending the right chest wall (black arrow) and a large sac-like mass with air and fluid in the right medial chest (red arrows).

A thoracic CT scan was performed to better define the abnormalities (Figure 3).

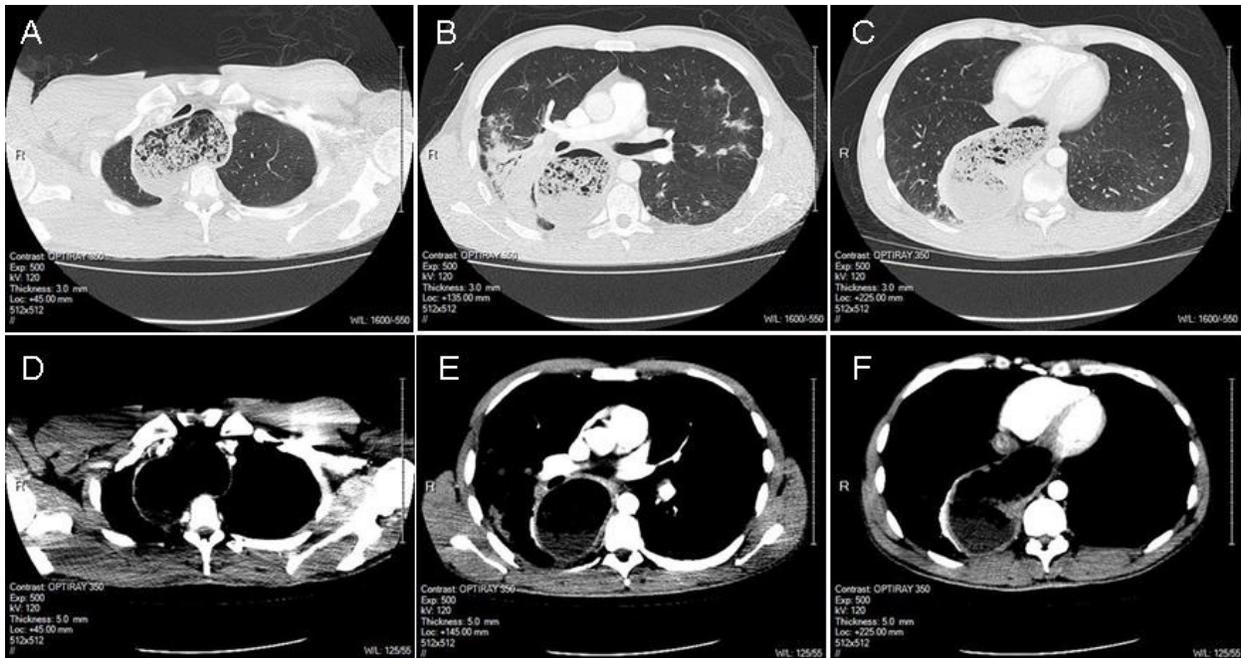


Figure 3. Selected static images from thoracic CT scan. Panels A-C: lung windows. Panels D-F: soft tissue windows.

Which of the following is the **appropriate next step** regarding the patient's large fluid and air filled sac in the right chest?

1. Bronchoscopy
2. Esophagogastroduodenoscopy (EGD)
3. Pulmonary CT angiography
4. Right tube thoracostomy (chest tube)
5. Surgical exploration of the chest in search of a laceration in the airway and/or esophagus

Correct!

2. Esophagogastroduodenoscopy (EGD)

After examination the trauma surgeons could find no trauma issues. The patient was admitted to a medical floor. The large sac-like air and fluid filled mass in the right chest was most likely a massively dilated esophagus. On further questioning the patient reported that he was having dysphagia with intermittent painful swallowing (odynophagia). He sometimes regurgitated food even hours after eating. He did not report any cough or weight loss. Gastroenterology was consulted. After two unsuccessful attempts because of retained food particles, EGD revealed findings suggestive of achalasia. Achalasia, also known as esophageal achalasia, achalasia cardiae, cardiospasm, and esophageal aperistalsis, is an esophageal motility disorder involving the smooth muscle layer of the esophagus and the lower esophageal sphincter (LES). It is characterized by incomplete LES relaxation, increased LES tone, and lack of peristalsis of the esophagus (inability of smooth muscle to move food down the esophagus) in the absence of other explanations like cancer or fibrosis.

The diagnosis of achalasia is reached with EGD, esophageal manometry and barium swallow. Various treatments are available, although none cures the condition. Certain medications or Botox may be used in some cases, but more permanent relief is brought by esophageal dilatation and surgical cleaving of the muscle (Heller myotomy).

Which of the following are **potential causes** of the consolidation in the right lung?

1. Aspiration pneumonia
2. *Mycobacterial* infection
3. Pulmonary contusion
4. All of the above
5. None of the above

Correct!
4. All of the above

Pulmonary contusion is possible but very unlikely given his history and lack of trauma elsewhere. Sputum cultures were obtained at admission. HIV testing, coccidiomycosis serology and *Trypanosoma cruzi* serology (Chagas disease) were all negative. He was begun on antibiotics for suspected aspiration pneumonia from his achalasia. After a few days in the hospital he signed out against medical advice (AMA).

Shortly after the patient left, the laboratory called saying that his initial sputum culture was growing acid-fast bacilli (AFB).

Which of the following would be **most likely** to explain his positive AFB culture?

1. *Mycobacterium avium-intracellulare complex (MAC)*
2. *Mycobacterium chelonae*
3. *Mycobacterium fortuitum*
4. *Mycobacterium kansasii*
5. *Mycobacterium tuberculosis*

Correct!

2. *Mycobacterium chelonae*

3. *Mycobacterium fortuitum*

Achalasia has been associated with the rapidly growing non-tuberculosis *Mycobacterium* (NTM) of which *M. Chelonae* and *fortuitum* are two (3-7). These organisms grow on culture plates in less than seven days while *Mycobacterium tuberculosis* and the atypical *Mycobacterium kansasii* and *avium-intracullarle* take longer to grow. The classical symptoms of pulmonary tuberculosis such as fever, night sweats and weight loss are uncommon in these patients. The most common radiological finding seen in patients with achalasia and NTM is basal consolidation which is often similar to aspiration pneumonia. Cavitation and upper lobe involvement are quite uncommon. Treatment of NTM is different from *M. tuberculosis*. The rapidly growing *Mycobacteria* are usually susceptible to macrolides, tetracyclines, fluoroquinolones and sulphonamides. Treatment duration is recommended for 9–12 months.

References

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