You're the Flight Surgeon

This article was prepared by Brian Y. Park, D.O.

It is another well-deserved weekend off for you, the flight surgeon for a Naval fixed-wing community on the East Coast. Saturday you get a call from a senior pilot in your squadron who is on leave out of state. He admits for the past 3 d experiencing chest pain, increased belching, feeling like "something's in my throat when I swallow," and nausea. He states it is not painful for him to swallow; it simply feels like "pressure." He also states that it is hard for him to take in a full breath because it worsens the pin-point chest pain located under his xyphoid. He reports symptoms of runny nose, cough, and sore throat that started about a week prior to development of current complaints. However, these symptoms are all improving. He denies fevers, chills, radiation of chest pain into the arm, neck or jaw, palpitations, tingling or numbing of fingers, emesis, or shortness of breath. He also denies ever having these symptoms before. This call catches you off guard because he is a 35-yr-old otherwise healthy individual without any chronic medical conditions who takes no medication and never complains about his health.

1. He doesn't return from leave for another 2 d. What is your recommendation?

A. Take an over-the-counter antacid.
B. Go to an urgent care.
C. Go to the emergency room (ER).
D. Hang in there until you are back in town and come to sick call.

ANSWER/DISCUSSION

1. C. At this point it is difficult to gauge the acuity or severity of his symptoms given that you are not able to examine him in person. However, for someone with acute chest pain you are unable to examine, you lean toward sending him to the ER. He goes on to tell you that since his symptoms were so severe and unusual, he already visited a local civilian ER the night prior. He received labs that were reportedly normal and he was discharged with a prescription for omeprazole. He does not have any lab results with him, so it is unclear which labs were performed. Since being discharged, his symptoms have worsened. Now he is having difficulty sleeping at night because his chest pain is worse when he lies on his back. The pain is not reproducible and does not change with eating. He continues to report belching and a foreign body sensation with swallowing.

2. What would you include in your differential diagnosis?

A. Ischemic heart disease.
B. Musculoskeletal.
C. Acute pericarditis.
D. Gastroesophageal disease – gastroesophageal reflux disease, esophageal motility disorders, peptic ulcer, gallstones, etc.
E. Mass effect – lung cancer, cyst, etc.
F. All of the above.

ANSWER/DISCUSSION

2. F. The quality of anginal pain is a pressure, tightness, squeezing, heaviness, or burning and is typically located retrosternally, often with radiation to or isolated discomfort in neck, jaw, shoulders, or arms.[4] This is very different from this pilot's sharp localized pain located directly under his xyphoid. However, with all chest pain, you want to rule out any cardiac causes. The fact that his pain is aggravated by taking a deep breath and while laying supine fits with a classic presentation of acute pericarditis. However, it does not explain his belching and dysphagia. Esophageal diseases are unlikely to present acutely in someone without a history of reflux. Even if it did, the pain is not associated with eating and he should receive some relief from the antacid medications. However, spasm or motility disorder is still possible. Given the acute onset, you keep telling yourself that it cannot be a tumor or some type of a mass, but you know this must be ruled out as well. The focal location and aggravation of the pain with deep inhalation might suggest musculoskeletal etiology. However, in most cases, musculoskeletal pain should be reproducible with palpation.

Upon further questioning, you are able to tease out that the chest pain is better when he is sitting up and leaning forward as well as worse when in supine. A light bulb goes on in your head and you make the association that this is a characteristic of chest pain in the setting of acute pericarditis.[1] Feeling proud, you let him know that you have an idea of what's going on.

3. Assuming that your presumed diagnosis of acute pericarditis is correct, how do you want to treat over the phone?

A. Nonsteroidal anti-inflammatory drugs (NSAIDs).

DOI: 10.3357/AMHP.3997.2015

B. Aspirin.
C. Aspirin and colchicine.
D. No meds.

ANSWER/DISCUSSION

3. B. Acute pericarditis should be treated with NSAIDs as the initial treatment. However, in situations where acute myocardial infarction has not been ruled out as the cause of chest pain, aspirin is preferred for the antithrombotic efficacy. Colchicine maybe used in conjunction with NSAIDs/aspirin, but it has been shown to be effective only in recurrent pericarditis.[3] You choose to treat with aspirin since you have not ruled out cardiac etiology.

The member finally arrives back in town for you to examine him in person. He notes that since starting aspirin 2 d ago, his symptoms are somewhat better and he was finally able to sleep the night before. However, he is still complaining of chest pain and dysphagia. During your physical exam, vitals are all within normal limits, oropharynx is mildly injected sans exudates, neck exam is without jugular venous distension, adenopathy, masses, thyromegaly, or bruit. His chest pain under his xyphoid was not reproducible with palpation and he did not have any chest deformities or rashes. Lungs were clear and cardiovascular exam revealed regular rate and rhythm without any murmurs or rubs. Pericardial rub was assessed by having the patient lean forward and take in a deep breath while listening at the apex—no rub was detected. Abdomen was soft, nondistended, nontender, sans palpable masses or organomegaly. He did not have edema or tenderness of his extremities. His ER report demonstrates a normal electrocardiogram, cardiac enzymes, complete blood count, and comprehensive metabolic panel.

4. What would you like to do now?

A. Strep test to evaluate for the sore/red throat.
B. Chest X-ray to rule out mass effect.
C. All of the above.
D. None. You nailed the diagnosis and treatment. Relax and let the meds do the job.

ANSWER/DISCUSSION

4. B. Basic exams to obtain in a suspected pericarditis include electrocardiogram, cardiac enzymes, basic chemistry, complete blood count, erythrocyte sedimentation rate or C-reactive protein, and chest radiograph. In this situation, chest radiography will also check for any thoracic masses of concern and allow assessment for evidence of pleural and/or pericardial effusion (both can be associated with pericarditis). Strep test is not indicated in this situation since his symptoms and the physical exam are not consistent with strep pharyngitis.

You order all the labs except for what was already performed in the ER. Later in the day, you receive a call from the radiologist notifying you of the X-ray findings. He tells you that there is a possible mediastinal mass and that he recommends an urgent computed tomography of the thorax and a consult to cardiothoracic (CT) surgery. You ask the radiologist what he thinks this could be and he says possibly a bronchogenic cyst or a tumor.

5. You remember hearing and/or learning the term "bronchogenic cyst" at some point. What is your recollection of this condition?

A. An abnormal bronchus that originates from the trachea, carina, or other bronchus and is directed to the upper lobes.
B. Anomalous budding of the foregut during development.
C. Congenital anomalies of the aortic arch that result in compression of the tracheobronchial tree and/or esophagus.
D. Nonfunctioning lung tissue that lacks normal communication with the tracheobronchial tree and receives its arterial blood supply from the systemic circulation.

ANSWER/DISCUSSION

5. B. Bronchogenic cyst is part of the bronchopulmonary foregut malformation spectrum developing from anomalous budding of the foregut. It can occur anywhere along the tracheobronchial tree. As rare as these lesions are, they are one of the most common lower respiratory tract malformations.[6] Answer A describes tracheal bronchus, answer C describes a vascular ring, and answer D describes bronchopulmonary sequestration. Of note, most bronchogenic cysts are not associated with symptoms—they are most often an incidental radiographic abnormality. However, cysts can become symptomatic in the setting of sudden growth from secondary infection or hemorrhage.

You get in touch with the CT surgeon, who agrees that this is likely a bronchogenic cyst, but recommends surgical intervention to make a definitive diagnosis, resolve symptoms associated with this mass, and prevent additional late complications. The size and location of the mass indicate an open surgical approach (thoracotomy). In addition, the member will require further treatment if the pathology returns as a malignancy. After consulting with both the CT surgeon and you, the member decides to go ahead with total excision. Three weeks later, the mass is excised successfully and the pathology report confirms a diagnosis of bronchogenic cyst. The pilot is now stuck in a down-status since the procedure and stops by your office on a daily basis to ask when he can return to flight.

6. What do you tell this eager pilot?

A. As soon as you feel back to normal.
B. Can you Valsalva? If yes, right now.
C. When you are cleared by the surgeon and receive a waiver.
D. As soon as you can run a mile.

ANSWER/DISCUSSION

6. C. Bronchogenic cyst is not mentioned in the Navy's Aeromedical Reference and Waiver Guide,[5] so you consult with the Naval Aerospace Medical Institute in Pensacola, FL. You are advised to submit a waiver once the member has been cleared by the CT surgeon with a normal chest X-ray. The Army's medical standards state, "Current abscess of the lung or mediastinum does not meet the standard".[8] But it does not expand to say what is required for a designated aviator to get back to flying duties. According to the Guide for Aviation Medical Examiners, for civilian aviators with malignant tumors or cysts of the lung, pleura, or mediastinum, all pertinent medical

information and a current status report must be submitted for a Federal Aviation Administration decision.[2] Air Force Instruction 48-123 does not mention bronchogenic cyst.[7]

Once the member was cleared by his CT surgeon, and with a normal chest X-ray, his waiver package was submitted; a waiver was granted shortly thereafter by the Naval Aerospace Medical Institute. The pilot has been flying without any issues since then.

Park BY. ***You're the flight surgeon: bronchogenic cyst.*** **Aerosp Med Hum Perform. 2015; 86(2):144–146.**

ACKNOWLEDGMENTS

The author would like to thank Jared Lee Antevil, M.D., Cardiothoracic Surgery, Naval Medical Center, Portsmouth, VA, for his guidance and review of this article. The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Department of the Navy, the Department of Defense, or the U.S. Government.

REFERENCES

1. Braunwald E. Pericardial disease. In: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J, editors. Harrison's principles of internal medicine, 18th ed. New York: McGraw-Hill; 2012:1971-8. [Accessed 2013 Dec. 5]. Available from http://www.accessmedicine.com/content.aspx?aID=9127509.
2. Federal Aviation Administration. Guide for aviation medical examiners. Washington, DC: Federal Aviation Administration; 2013:71. [Accessed 2013 Dec. 5]. Available from http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/media/guide.pdf.
3. Imazio M, Brucato A, Cemin R, Ferrua S, Maggiolini S, et al. A randomized trial of colchicine for acute pericarditis. N Engl J Med 2013; 369:1522–1528.
4. Lee TH. Chest discomfort. In: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J, editors. Harrison's principles of internal medicine, 18th ed. New York: McGraw-Hill; 2012:102-7. [Accessed 2013 Dec. 5]. Available from http://www.accessmedicine.com/content.aspx?aID=9094636.
5. Naval Aerospace Medical Institute. Aeromedical reference and waiver guide. Pensacola, FL: Naval Aerospace Medical Institute; (n.d.). [Accessed 2013 Dec. 5]. Available from http://www.med.navy.mil/sites/nmotc/nami/arwg/Pages/AeromedicalReferenceandWaiverGuide.aspx.
6. Nobuhara KK, Gorski YC, La Quaglia MP, Shamberger RC. Bronchogenic cysts and esophageal duplications: common origins and treatment. J Pediatr Surg. 1997; 32:1408–1413.
7. U.S. Air Force. Medical examinations and standards. Washington, DC: Department of the Air Force; 2013. Air Force Instruction 48-123. [Accessed 2013 Dec. 5]. Available from http://static.e-publishing.af.mil/production/1/af_sg/publication/afi48-123/afi48-123.pdf.
8. U.S. Army. Standards of medical fitness. Washington, DC: Department of the Army; 2011:12. Army Regulation 40-501. [Accessed 2013 Dec. 5]. Available from http://armypubs.army.mil/epubs/pdf/r40_501.pdf.

This article was prepared by Elton Tay, Dip. Av.med., and Wee Hoe Gan, Dip. Av.med.

You are the flight surgeon conducting aircrew centrifuge training. A 25-yr-old aircrew has just completed his centrifuge profile and comes to you complaining that his left foot feels unusual when he walks. You notice that he has a left partial foot drop and is unable to dorsiflex the left foot fully.

1. Your next course of action is to discharge the patient with some muscle strengthening exercises for the left foot.

A. True
B. False

ANSWER/DISCUSSION

1. B. A sudden unilateral foot drop should be worked up as it may suggest underlying myopathy or neuropathy. Dorsiflexion of the foot arises from the actions of the anterior tibialis, extensor digitorum longus, and extensor hallucis longus muscles. Foot drop may result from direct injury to these muscles (muscle or tendon ruptures). Injury to the nerves that innervate these muscles may also be the possible reason for the foot drop.

You take a detailed history and find out that the aircrew has a history of back pain previously, which resolved with physiotherapy.

2. If you had only one option, which of his old MRI scans would you want to review?

A. Cervical spine MRI scans.
B. Thoracic spine MRI scans.
C. Lumbosacral spine MRI scans.

ANSWER/DISCUSSION

2. C. Foot drop may result from lumbosacral plexopathy or lumbar (L5) radiculopathy. L5 innervates ankle dorsiflexors such as the anterior tibialis and extensor hallucis longus.

The patient's old lumbosacral MRI shows only mild degenerative changes, with no signs of nerve impingement. He has no family history of nerve disorders and has no history of systemic disease. This is his first episode of foot drop or any muscle weakness.

You commence on your physical examination and look at the aircrew's left foot. You find that there is no swelling or bruising to suggest tendon rupture or a traumatic cause for the foot drop. You examine his spine, which reveals no tenderness and no paravertebral spasm. He has no limitations when performing straight leg raising.

DOI: 10.3357/AMHP.3960.2015