

# EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER  
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

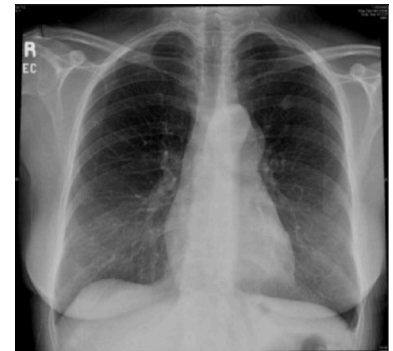
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May 2017 | Vol 3 | Issue 38

## Viral Pericarditis

A 43-year-old female presents to the ER with dizziness and fatigue for nine days. She complains of generalized constant weakness. Her associated symptoms include vomiting, shortness of breath and a productive cough. She started Zithromax three days ago for an upper respiratory illness. Vitals include: T: 98 F HR: 120 bpm RR: 18 bpm BP: 104/85 mmHg, Pulse Oximetry: 100 % room air. Physical exam is significant for diminished right-sided breath sounds. IV fluid lines are established. Laboratory results show elevated liver enzymes, troponin of 4.3, BNP of 196, lactic acid of 4.1. Half an hour later, the patient has an unwitnessed syncopal event and becomes unresponsive. Her blood pressure now measures 85/50 mmHg with bilateral elevated jugular venous pressures. What is the next best step in management?

- A. Immediate CT scan of the brain without contrast
- B. IV administration of 1 mg of Ativan
- C. IV administration of nitroglycerin
- D. Immediate chest tube
- E. Immediate pericardial window



This is a normal pericardium. Courtesy of website.<sup>2</sup> See references.



This x-ray depicts cardiac tamponade, a potential fatal sequelae of pericarditis. Courtesy of website.<sup>3</sup> See references.

*EM Case of the Week is a weekly "pop quiz" for ED staff.*

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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## The correct answer is E. Immediate pericardial window

Viral pericarditis typically arises from a preceding respiratory infection usually caused by the same agent. The pericardial sac inflammation can further develop into myocarditis or pericardial effusion. Conservative treatment includes NSAIDs and colchicine. As this patient's vitals became unstable, cardiac tamponade was highly suspected, requiring a pericardial window.

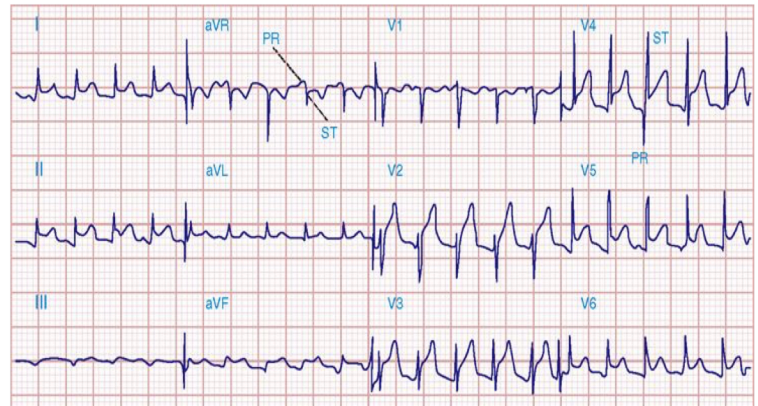
### Discussion

**Acute pericarditis is the most common pathology affecting the pericardium.** Pericarditis typically presents with four main clinical signs and symptoms, chest pain, friction rub, ECG changes and pericardial effusion. The chest pain can be described as severe, retrosternal, left precordial and referred to the neck, arms or left shoulder. The pain can also be pleuritic, sharp and worse upon inspiration and with coughing. Sitting up and leaning forward relieve the pain, differentiating these symptoms from an acute myocardial infarction.

On physical exam, a pericardial friction rub can be heard. It is a high-pitched scratching sound best heard at the end of expiration with the patient upright and leaning forward.

ECG findings common to pericarditis are due to subepicardial inflammation. **There are four stages of ECG changes.** Stage one is diffuse ST segment elevations with upward concavity involving V2 to V6 with reciprocal depressions in aVR and sometimes V1. PR segment depressions can also be seen. There are usually no QRS changes. After several days, the stage 2 ECG no longer shows ST segment elevations. As time continues, the ECG may develop T wave inversions representing stage 3. After weeks to months of the initial onset, the ECG is back to normal with no evident changes, stage 4.

This ECG depicts diffuse ST segment elevations. Courtesy of Harrison's Internal Medicine.<sup>1</sup>



Pericardial effusion may also occur. If the effusion occurs quickly, cardiac tamponade can develop. The ECG will likely show electrical alternans. **Cardiac tamponade is a serious complication of pericarditis as it causes obstruction of the inflow of blood into the ventricles and can be fatal.**

### Infectious Etiologies of Pericarditis

Pericarditis may result from various infections. Viral pericarditis often occurs after a respiratory illness. Common viral agents are coxsackievirus A/B, echovirus, mumps, adenovirus, influenza, hepatitis, and HIV. Pyogenic pericarditis can be due to pneumococcus, streptococcus, staphylococcus, neisseria and legionella. Other infectious etiologies include tuberculosis, histoplasmosis, coccidioidomycosis, candida, blastomycosis, syphilis, protozoal, and parasitic.

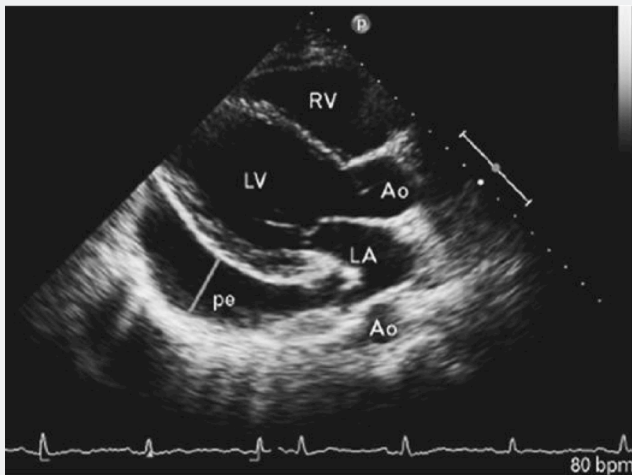
Viral and idiopathic pericarditis are associated with pleural effusions and pneumonitis. Fever and precordial pain develop 10- 12 days after the initial viral illness. The symptoms are often mild to moderate and resolves anywhere from days to weeks.

For a list of educational lectures, grand rounds, workshops, and didactics please visit [BrowardER.com](http://BrowardER.com) and click on the "Conference" link.

*All are welcome to attend!*

# Warriors

Diagnosis is often based on the patient's history, presenting symptoms, physical exam findings and ECG. Additional tests such as blood tests and imaging can be normal. The echocardiography is necessary if the patient shows signs of pericardial effusion or cardiac tamponade. Laboratory results can show elevated troponin levels and CK-MB due to inflammation of the epicardium resulting in myocyte necrosis. Lactic acid may be elevated due to compromised ejection fraction leading to hypoperfusion of the organs.



This echocardiographic image shows a significant pericardial effusion. Courtesy of Harrison's Internal Medicine.<sup>1</sup>



## ABOUT THE AUTHOR

This month's case was written by Reem Itani. Reem Itani is a 4<sup>th</sup> year medical student from NSU-COM. She did her emergency medicine rotation at Broward Health North in January 2017. Reem plans on pursuing a career in Internal Medicine after graduation.

## Treatment

**Patients with presumed viral pericarditis are treated with NSAIDs or colchicine.** Aspirin 2-4 g/d, ibuprofen 400-600 mg t.i.d. or indomethacin 25-50 mg t.i.d. can be used for one to two weeks and then tapered over several weeks. In patients that do not respond to NSAIDs, 0.5 mg of colchicine b.i.d. can be given for 4-6 weeks. Colchicine reduces the risk of recurrent pericarditis as well. Patients that remain unresponsive to NSAIDs and colchicine can be started on prednisone 1mg/kg. **Glucocorticoids may increase the risk of recurrent pericarditis.** Thus treatment with steroids is recommended only for 2-4 days and then tapered down. **Anticoagulants are not recommended due to increased risk of a bleed in the pericardium resulting in tamponade.** A pericardiectomy or pericardial window is indicated for frequent recurrent unresponsive pericarditis or recurrent cardiac tamponade and hemodynamic instability.

## Take Home Points

- Look for the presentation of acute pericarditis: chest pain improved by leaning forward, friction rub, ECG changes of diffuse ST elevations and PR segment depressions, and pericardial effusions
- Pericarditis can be treated conservatively with NSAIDs and colchicine
- If cardiac tamponade occurs, immediate pericardial window is necessary

## REFERENCES

1. Kapper, D. et al. Harrison's Principles of Internal Medicine. 19<sup>th</sup> edition. Vol. 1. McGrawHill: 2015. pg. 1571-1576
2. Voigt, S. Photo on How to read a chest x-ray. South Sudan Medical Journal. 2012. <http://www.southsudanmedicaljournal.com/archive/2008-05/how-to-read-a-chest-x-ray-a-step-by-step-approach.html>
3. Bulla-Rudas, F. et al. Photo of pericarditis in thirteen year old Male. DCMS Clinical Images in Medicine. 2014. <http://clinicalimagesinmedicine.blogspot.com/2014/07/pericarditis-in-13-year-old-male.html>