46 years old woman with chest pain

Case conference 4/1/08
Past Medical History

- Ischemic heart disease
  - Past anterior MI by echo and NM testing
  - DES in 10/05
  - EF had improved from 45% to 50-55% in 2006
  - Past episodes of heart failure
- Diabetes mellitus, type II, diagnosed 1993
- Obstructive sleep apnea
- Chronic anemia
Social history & Family history

- Works in produce department
- Quit smoking cigarettes 8/07 after 30 pack years
- No alcohol, no illicit drug use
- Family history of diabetes and ASCVD (dad died at 60 of MI)
History of present illness

- One day prior to admission she noticed a few twinges of chest pain.
- Day of admission she noted chest pain that was acute in onset, severe, substernal and radiated to both sides of chest, and positional.
- She had noted a dry cough and fevers two weeks ago that had resolved 1 week ago.
Physical exam

- Vitals: Temp 97.3° F, BP 158/86, HR 85, RR 24, SaO2 100%
- Respiratory: clear to auscultation
- CV: regular rate and rhythm with normal S1 and S2, no murmur or rub, no S3 or S4
- Abdomen: soft, non-tender, bowel sounds present
- Neurologic: non-focal
Initial data

- WBC 14.7, Hgb 12.0, Plts 408
- Lytes normal, Cr 1.5 (baseline about 1.0)
- BNP 138, Troponin neg
- CXR: mild cardiomegaly but no failure or infiltrates
- Chest CT with contrast: small to moderate sized pericardial effusion, no pulmonary embolism or infiltrate
Vent. rate: 93 BPM
PR interval: 150 ms
QRS duration: 70 ms
QT/QTc: 342/425 ms
P-R-T axes: 34 2 40

Normal sinus rhythm
Anteroseptal infarct, age undetermined
Abnormal ECG
Compared to EKG of 17-July-2007
No significant change

DIAGNOSIS: CP SOB

Referred by: 

Confirmed By: JON HOKANSON, MD
Assessment and Plan

- Chest pain deemed likely from pericarditis
  - echo ordered
  - ibuprofen started
  - follow up EKG and troponin

- ASCVD: continue aspirin, clopidogrel, carvedilol, losartan, furosemide, atorvastatin

- Diabetes: continues home insulin and glyburide but hold metformin
Initial hospital course

- First contact in ED at 2212 on 11/27
- Admitted at 0300 on 11/28
- Still having chest pain that afternoon requiring opiate pain medications but improving some
- Echocardiogram shows normal EF, small pericardial effusion without tamponade
- Troponin negative
11/29

- Pain still moderately severe and given a dose of ketorolac overnight
- Vitals normal
- Exam unchanged
- Creatinine 4.3, BUN 50, CO2 20, K 5.8
- WBC 13.9, Hgb 10.8
- ESR 99
- UA: some protein, 1 RBC, 3 WBC
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**AGE AND GENDER SPECIFIC ECG ANALYSIS**

- Vent. rate: 77 BPM
- PR interval: 146 ms
- QRS duration: 74 ms
- QT/QTc: 384/434 ms
- P-R-T axes: 42 16 23

- Normal sinus rhythm
- Anterior infarct (cited on or before 27-NOV-2007)
- Inferolateral ST elevation noted, could be consistent with injury.
- Pericarditis

**ACUTE MI**

- Abnormal ECG
- When compared with ECG of 27-NOV-2007 21:58, ST elevation is now present

Referred by:  
Confirmed By: MICHAEL CUMMINGS, MD

Technician: 1116  
Test ind: ASAP
New Assessment and Plan

- Chest pain: still deemed pericarditis
  - NSAID’s stopped due to ARF
  - Start steroids

- Acute renal failure likely due to contrast, NSAID’s, and possibly hypovolemia in the face of ARB
  - Stop NSAID’s
  - Stop ARB
  - Isotonic volume with some HCO3
  - Florinef
  - Kayexalate and recheck K
Pericarditis course

- Steroids continued
- Pain improves
- EKG returns to baseline
- Plan for steroid taper
Acute renal failure course

- Urine output increases with IVF
- Creatinine peaks at 5.3 on 11/30 and then improves to 1.1 on 12/4
- ARB restarted and creatinine remains stable as outpatient
Diabetes

- Insulin needed to be titrated up due to stopping metformin and steroids
- Discharged on insulin and glyburide with need for close follow up to wean insulin with steroid wean and consideration of restarting metformin
Pericarditis
Epidemiology

¢ Exact incidence and prevalence is not accurately known
¢ 0.1% of hospitalized patients
¢ 5% of patients presenting to the emergency department with non-ischemic chest pain
Etiology

- Idiopathic: presumed viral induced and/or autoimmune
- Infectious: many possible infectious etiologies
- Autoimmune: SLE, RA, etc
- Drugs: procainamide, isoniazid, dantrolene, etc
- Metabolic: hypothyroid, uremia, etc
- Neoplastic: lung, breast, lymphoma, primary cardiac, etc
- Radiation
- Myocardial infarction, myocarditis, or dissecting aortic aneurysm
- Trauma: including catheter complications
Etiology Determination

- Past studies have shown poor ability to come up with a diagnosis with one study reaching a firm diagnosis in 16% of the cases after an extensive workup.
- More recent studies have shown more success with newer techniques.
Diagnosis

- Requires 2 of the following
  - Chest pain
  - Pericardial friction rub: may be less prevalent with an effusion
  - Biomarkers: troponin or CKMB
  - Signs of inflammation: elevated WBC, ESR, and/or CRP
Workup

- **EKG**
  - Diffuse ST elevation and PR depression
  - May get T wave inversion after ST and PR segments normalize

- **Echocardiogram:**
  - Often normal
  - Will reveal the pericardial effusion if present

- **CXR:**
  - May show the pericardial effusion if present
  - May be normal
Initial evaluation of pericarditis

- Acute pericarditis does not require an extensive workup for the etiology unless:
  - There is an apparent associated medical or surgical condition
  - The patient is immunocompromised

- Additional tests that should be performed:
  - Echocardiogram (looking for tamponade)
  - PPD
  - ANA
  - HIV
  - Blood cultures if fever is present
Risk factors for severe disease

- Subacute symptoms
- High fever (>38.0) and leukocytosis
- Evidence of tamponade
- Large effusion (>20 mm)
- Immunosuppressed state
- On anticoagulation
- Acute trauma
- Failure to respond to initial therapy
- Elevated troponin
Treatment

- Treat primary disease if present & known
- Post-MI pericarditis treated with aspirin
- NSAID’s as first line
- Colchicine
  - May be added to NSAID’s
  - May decrease risk of recurrence
- Steroids
  - For patients with CTD, immune-mediated, or uremic cause
  - If refractory to or contraindications to above
Prognosis

- Good long term prognosis
- 5-28% have tamponade
- 1% develop constrictive pericarditis

Recurrence rate
- 15-30% not given Colchicine
- 10-15% given Colchicine
- Increased with refractory disease, steroid therapy, inappropriate pericardiectomy