Pericardial Disease
A New Look at an Old Disease
2013 Update

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No conflict of interest

Pericardial Disease
A Simple Problem?

Diagnosis
Inflammation
Fluid
Constriction

Pericardial Disease
A Simple Problem?

Treatment
Reduce Inflammation
Remove Fluid
Remove Pericardium

Pericardial Disease
A Simple Problem?

Misdiagnosed
Under-treated
Pericardial Disease

A 46 y/o man presents with 2 days of severe pleuritic chest pain, preceded by an URI

On exam BP 120/70 HR 90
JVP normal  Carotid full
Normal heart sounds
3 component rub at LSB

By the way
What do you call two orthopods reading an ECG?

A Double-Blind Study…
What would you do now?

Echocardiogram
Normal LV size function
No RWMA
No pericardial effusion

Pericardial Disease
You do not need an echocardiogram to diagnose acute pericarditis
A normal echocardiogram does not rule out acute pericarditis
Pericardial Disease

Acute pericarditis
✓ Inflammation of the pericardium usually due to a viral infection
✓ Diagnosed by history, rub and elevated sed rate + EKG
✓ Troponin valuable for risk-stratification
 ✓ Inpatient admission if positive

Pericarditis
Diffuse ST elevation
“Like a smile”
PR depression

Other tests needed only in certain circumstances
• Autoimmune profile if recurrent
• Viral titers of little use
• PPD, HIV serology only if high level suspicion
• Echo if high JVP or pulsus paradoxus

How would you treat this patient?
1. Short burst of steroids
2. NSAID and colchicine
3. ASA and colchicine
4. Interferon
5. Colchicine
The patient was treated with steroids for one month (40 taper to 20 mg).

Recurrence 1 month later

Recurrent debilitating pericarditis whenever predisone is dropped below 15 mg.

**Treatment of acute pericarditis**

- Best: NSAID or ASA (high dose) for at least one month, then taper slowly (watch sed rate)
- Add colchicine for 6 months
- Do **NOT** use steroids because of risk of relapsing pericarditis.
Pericardial Disease

Severe relapsing pericarditis

- Multiple recurrent episodes of pericardial pain and high sed rate
- Usually associated with rapid steroid taper

Medical Rx

- High dose ASA - slow taper off prednisone while on ASA (level 10-20)
- Colchicine
- Complete pericardiectomy

Surgical Pericardiectomy for Relapsing Pericarditis

Event-free survival

- Surgical: P=0.009
- Medical

Pt at risk

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<th>Medical</th>
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Pericardial Effusion
Pericardial Disease

Pericardial Effusion

Benign
- Normal JVP
- No pulsus

Tamponade
- Elevated JVP
- Pulsus paradoxus
- Subtle Doppler findings

Echo-Directed Pericardiocentesis

Indication
- Large effusion
- Any effusion with tamponade
- Any effusion with subclinical tamponade

The Diagnostic Challenge
Clinical Presentations

The 72 y/o man presents with weight loss and severe edema of both extremities for cancer workup

Clinical Presentations

The 52 y/o runner who has just “lost steam”

Clinical Presentations

The 66 y/o woman with severe SOB following aortic valve replacement 10 months ago

Constrictive Pericarditis

- Right heart failure out of proportion to left sided disease
- A treatable etiology of heart failure
Constrictive Pericarditis

Early diagnosis and treatment is critical
Operative risk
Long term outcome

Case History

44 y/o woman
Prior radiation Hodgkins 15 yrs ago
Now presents with 2 yrs edema, ascites and fatigue
Exam: JVP 20 cm with rapid Y descent
No murmurs or knocks audible

Constrictive Pericarditis

Operative Risk
Mayo Data
313 pts

Constrictive Pericarditis

Post-op Survival
NYHA I-II
NYHA III-IV

Survival (%)
100 90 80 70
0 1 2 3 4 5

JTCVS 90:506 1985
What to do next?

1. MRI
2. Cath
3. Medical Rx
4. Surgical exploration

Cath criteria: CP
- End equaliz pressures
- LVEDP = RVEDP
- RVEDP > 1/3 RVSP
- PA < 50 mmHg

Constrictive Pericarditis
**Pericardial Thickness: CT/MRI**

- Normal pericardium on CT/MRI: 22% pts with proven CP
- Thickened pericardium: 70% pts after radiation or bypass

**Constrictive Pericarditis**

**Differential Diagnosis - 2013**

- Constrictive Pericarditis
- Restrictive Cardiomyopathy

**History and Exam**

**Classic presentation**

- Right heart failure
- Elevated JVP
- Rapid X and Y descent
Echo Evaluation of Constrictive Pericarditis

Referral: CHF
See: Normal LV function
Normal valves

Look for: Septal shudder
Septal shift (insp)
Dilated IVC
Echo Evaluation of Constrictive Pericarditis

If you see: Septal shudder
Septal shift (insp)
Dilated IVC

Get hemodynamic information

Constrictive Pericarditis

The hemodynamics are dynamic during the respiratory cycle and reflect:
- Dissociation between intrathoracic and intracardiac pressures
- Increased ventricular interaction

Constrictive Pericarditis

Apnea

Insp

Normal RCM

Little change in the transmitral driving pressure during respiration
Constrictive Pericarditis

**Constriction**
Decrease in the transmitral driving pressure during inspiration

**History and exam**

- **2DE Doppler**

  **Classic presentation**
  - Septal bounce
  - Mitral flows

**Surgery**
**Constrictive Pericarditis**

The hemodynamics are dynamic during the respiratory cycle and reflect:
- Dissociation between intrathoracic and intracardiac pressures
- Increased ventricular interaction

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**Constrictive Pericarditis**

**Increased Ventricular Interaction**

Expiration → Inspiration

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**Constrictive Pericarditis**

Now go to the cath lab...
LV smaller: RV larger
Dissociation
Constrictive pericarditis
Enhanced ventricular interaction is the most sensitive and specific finding for constrictive pericarditis.

Time for a Clinical Case
Diagnostic Challenge
75 y/o prominent MD from academic center
Referred for “restrictive cardiomyopathy”

Past history complicated
  1998 PTCA LAD for “atypical chest pain”
  1999 Bradycardia PPM
  6/00 Acute chest pain – emergency angio
    Diagnosis acute pericarditis
  5/01 Recurrent pericarditis – colchicine
  8/01 Onset progressive SOB and edema
    Requiring increasing diuretics
    Now 120 mg furosemide BID

Multiple work-ups – multiple institutions
  Several catheterizations
    RA 12 mmHg – up to 20 mmHg
      with fluid
    Endomyocardial biopsy – fibrosis
      with myocyte hypertrophy
  Labs: proteins, iron, thyroid normal
  Skeletal muscle biopsy “atypical inclusion bodies”

Diagnosis: restrictive cardiomyopathy

Exam: BP 128/70 P 70
  JVP 18 cm – large “V”
  Lungs – clear
  LV quiet 1+ parasternal lift
  S1 normal S2 narrowly split
    Soft 1/6 barely audible
    Holosystolic murmur
    Early diastolic filling sound
  Bilateral pitting edema

CXR: mild cardiomegaly, dual chamber PPM
  No pulmonary venous congestion
What would you do now?
What would you do now?

Final Impressions

1. Normal left ventricular size.
2. Calculated left ventricular ejection fraction: 71%.
3. Mild right ventricular enlargement.
4. Moderate left atrial enlargement.
5. Moderate right atrial enlargement.
8. Moderate tricuspid valve regurgitation.
9. Estimated right ventricular systolic pressure: 51 mmHg.
10. Indeterminate left ventricular diastolic function.
CT scan
Mild patchy pericardial thickening

What would you do now?
Look at LV/RV diastolic pressures

Inspiration

Constriction: equal

TR or RV dysfunction: RV>LV

Severe Tricuspid Regurgitation

✓ Increasing incidence from PPM and AICD
✓ Simulates constrictive pericarditis
✓ Subtle changes in diastolic pressures
Pericardial Disease
A Simple Problem?

Misdiagnosed
Under-treated

Which patient needs a needle vs “cold steel”?

150 mmHg
0 mmHg