

28. Pericardial Tamponade

Pericardial Effusions

1. Accumulation of Fluid
 - Normal pericardial fluid volume 15-50cc
 - Up to 2 liters can accumulate slowly in pericardium without problems
2. Determinants of cardiac compromise with effusion
 - Total Volume, Rate of accumulation, Pericardial distensibility
3. Causes of Effusions
 - a. Biopsy of pericardium and culture of fluid: Malignancy (23%), Viral (14%), Radiation (14%), CVD (12%), Uremia (12%) Other: Mycobacterial (7%), Mycoplasma (4%), Other Bacterial (2%); ? in 7%
 - b. Drug induced effusions should be considered (Procainamide, hydralazine, isoniazid, Doxorubicin)
4. Hemopericardium
 - a. Neoplasm most common – lymphoma, malignant metastases or primary cardiac tumor
 - b. Myocardial and great vessel rupture
 - c. Tuberculosis
 - d. Surgery, PTCA or Trauma
 - e. Uremia - coagulopathy may predispose to bleeding
5. Symptoms of Pericardial Effusion
 - a. Shortness of Breath
 - b. Dizziness - Hypotension
 - c. Fatigue
 - d. Pedal Edema
 - e. Cough
 - f. Symptoms of Tamponade should be evaluated (see below)
6. Electrocardiographic Changes
 - Diffuse low voltage, Electrical alternans, (as for pericarditis)
7. Evaluation of Pericardial Fluid
 - a. Complete fluid count with cell differential
 - b. LDH, pH, glucose, protein, consider amylase (pancreatitis)
 - c. Viral Titers / Culture - usually in serum
 - d. Stains for AFB, bacteria, fungus

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1. Classic Findings: (Classic Beck's Triad-Acute Pericardial Hemorrhage-↑ JVP, ↓ BP, quiet heart)
 - a. Low Blood Pressure
 - b. Pulsus Paradoxus (>10-15 mm pulsus) Fall in BP with normal inspiration. (Consider A-line).
 - c. Elevated Jugular Venous Pressure
 - d. Kussmaul's (Kuβmaul) Sign Inspiratory venous pressures steady or increased
 - e. In practice, these are unreliable indicators of impending cardiac arrest
2. Pathophysiology
 - a. Inability to fill the cardiac chambers in diastole
 - b. Rising intracardiac pressures
 - c. Reduction in stroke volume and cardiac output leads to hypotension
3. Diagnostic Evaluation
 - a. Chest Radiograph: increased cardiac silhouette only with >250cc fluid
 - b. Follow progression with heart rate and echocardiography
 - c. Echocardiographic Changes – RA & RV collapse: >30% free wall inversion during
 - diastole (respiratory flow variation in Mitral inflow) - LA collapse: LA wall inversion
 - d. Catheterization: equalization of chamber pressures, loss of Y descent
4. Treatment
 - a. Drainage of fluid, percutaneous
 - b. Pericardectomy or Pericardial Window may be required
 - c. Colchicine 0.6 to 1.2 mg daily bid decreases effusions (Adler Y. et al: Colchicine treatment for recurrent pericarditis. A decade. Circulation. 97(21):2183-5, 1998 Jun 2.)
 - d. Treat symptoms as for pericarditis